Faculty Based Bank Written Math

For

All Competitive Exam

Edited & Completed By:

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ভূমিকাঃ

প্রথমেই ধন্যবাদ জানাই বাংলাদেশের প্রথম **Faculty Based Written Math** বইটি কেনার জন্য। আপনি কোন **Faculty** এর অধীনে পরীক্ষা দিচ্ছেন, তা জেনে যদি ঐ **Faculty** র অধীনে অংকগুলো অনুশীলন করেন তাহলে খুব সহজেই আপনি অনেক অংক কমন পেয়ে যাবেন। কারণ একই **Faculty** তাদের অধীনে অনুষ্ঠিত **Exam** গুলো হতে প্রায় ৬০-৭০% অংক রিপিট করে।

যেমন **BIBM** এর অধীনে অনুষ্ঠিত পরীক্ষাগুলো বিশ্লেষন করে দেখা গেছে যে তারা তাদের অংকগুলো হুবহু কপি করে **Exam** নিচ্ছে। একইভাবে **Business Faculty, Arts Faculty, IBA, Social Science** সবাই একই পথ অনুসরন করছে। আমার বাস্তব জীবনের অভিজ্ঞতার আলোকে বলতে চাই এই বইটি আপনার চাকুরী পরীক্ষায় প্রত্যাশিত ভূমিকা রাখবে।

[Yousuf Ali]

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মূর্ধন্য ছোটন ও

Banking Career In Bangladesh এর সকল **member** যারা সবসময় আমার কাজে নানা ভাবে সহযোগিতা করেছে।

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Faculty of Business Studies,DU

Dhaka Bank Cash-2018

Question-01: A depositor deposited 4000 at x% and 5000 at y% and earned 320 as interest. if he could deposit 5000 at x% and 4000 at y% then he would earn 310. what is value of x and y.

[**Dhaka Bank Cash-2018**][**Basic Bank AM-2018]**

Solution:

According to the question,
{4000× x/100}+{5000×y/100}=320
40x+50y=320
Or, 4x+5y=32----------(1)
In the same way
{(5000*x)/100}+{(4000*y)/100}=310
Or, 5x+4y=31----------(2)
By doing (1)*5-(2)*4=»
20x+25y=160
20x+16y=124

Or, 9y=36
Or,y=4
Putting value of y in equation (1)
4x + 5*4=32
Or, x=3
So the value of (x,y)=(3,4)

Ans: (3,4)

Question-2:Selling 12 candies at a price of tk 10 yields a loss of x% and selling 12 candies at a price of tk 12 yields a profit of x% ..What is the value of x ? [South East Bank PO-2017]

[**Dhaka Bank Cash-2018**]
Solution:

Let,
12 candies cost price= Tk 100

x% loss selling price=(100-x)
Selling price(100-x) then cp 100 tk
sp 10. " {(100*10)/(100-x)}

x% profit selling price=(100+x) tk
Selling price tk(100+x) then cp tk100
Sp. 12. " {(100*12)/(100+x)}

According to the question,
{(100*10)/(100-x)}={(100*12)/(100+x)}
Or, x=9.09 So, the value of X is 9.09 **Answer:** 9.09

BKB-SO-2017

1: A man deposits 5000 tk. at 5% annual interest for six months. In every six months he withdraws tk.500 from his principal plus interest earned. What is the total amount of interest he received?
[BKB SO -2017][SEBL PO-2017]
Solution:
Given that,
Rate of interest is 5%
Since Interest Rate is semiannual,
=5/2=2.5%
So,
The total amount of Interest rate
he receive against Tk 5000
= Tk. (2.5% × 5000 + 2.5% × 4500 + 2.5% × 4000 + 2.5% × 3500 + 2.5% × 3000 + 2.5% × 2500 + 2.5% × 2000 + 2.5% × 1500 + 2.5% × 1000 + 2.5% × 500)
= Tk. 2.5% × 27500 =Tk. 687.5 Tk. Answer:687.5 Tk

2: A man interest and wages from his investment tk. 5000. If he invests double then the wages increased 50% and total amount is tk. 8000. What is his actual income in terms of wages and interest?
[BKB SO -2017]
Solution:
Let, Interest be Tk. X and Wages be Tk. Y
According to the Question,
X +Y= 5000
Or, X =5000-Y----------(1)
When investment is doubled then interest will be doubled
So,
2x +150% of Y=8000
∴Y=4000
From equation (I), X+ 4000= 5000 ∴X = 1000
Answer: Interest= Tk.1000 and wages= Tk. 4000.

3: 20 workers can finish a work in 30 days. After how many days should 5 workers leave the job so the work is completed in 35 days?
[BKB SO -2017][SBC AM -2016]
Solution:
Let,
After x days 5 men should leave

20 workers do in 30 days 1 part
20::::::::::::::::::::::::1::::1/30
20 ::::::::::::::::::::::::x::::::::::::x/30

Now
worker Remaining=(20-5)=15
Day left = (35-x)
And
Suppose,
Total portion of work be =1

then,
20 men in 30 d. do 1 part
1 " 1 " " 1/20*30
15 men 35-x " $\frac{15*(35-X)}{20*30}$

According to the question,
$\frac{X}{30}+\frac{15*(35-X)}{20*30}=1$
x=15
Answer:15 days

4: A man goes to his office at a certain time. If his waking speed is 5 kmh then he is 7 minutes late.When his speed is 6 kmh he reaches 5 minutes before. How far his office from his house? [BKB SO -2017]
Solution:
Let,
Total distance between home to office be X km
According to the Question,
X/5 -7/60 =x/6 +5/60 [Time=distance/Speed]
Or, X/5 - x/6 = 5/60 + 7/60
∴ X= 6 km
Answer: 6 km

5: In a mixture the ratio of apples, peaches and grapes is 6:5:2. If the total mixture is 39 pounds then what is the difference between apples and grapes?
[BKB SO -2017]
Solution:
Given that,
The ratio of Apples, Peaches and Grapes= 6:5:2
∴The sum of the ratio
= (6+5+2) =13
∴The quantity of Apple
= (39 × 6/13) = 18 pounds
∴The quantity of Grapes
= (39 × 2/13) = 6 pounds ∴The more pounds of apple than grape = (18-6) =12 Pounds
Answer:12 pounds

South East Bank PO-2017

1.Selling 12 candies at a price of tk 10 yields a loss of x% and selling 12 candies at a price of tk 12 yields a profit of x% ..What is the value of x ?
[South East Bank PO-2017]
Solution:
Let,
12 candies cost price= Tk 100
x% loss selling price=(100-x)

Selling price(100-x) then cp 100 tk
sp 10. " {(100*10)/(100-x)}

x% profit selling price=(100+x) tk
Selling price tk(100+x) then cp tk100
Sp. 12. " {(100*12)/(100+x)}

According to the question,
{(100*10)/(100-x)}={(100*12)/(100+x)}
Or, x=9.09
So,the value of X is 9.09
Answer:9.09

2: A man deposits 5000 tk. at 5% annual interest for six months. In every six months he withdraws tk.500 from his principal plus interest earned. What is the total amount of interest he received?[BKB SO -2017][SEBL PO-2017]
Solution:
Given that,
Rate of interest is 5%
Since Interest Rate is semiannual,
=5/2=2.5%
So,
The total amount of Interest rate
he receive against Tk 5000
= Tk. (2.5% × 5000 + 2.5% × 4500 + 2.5% × 4000 + 2.5% × 3500 + 2.5% × 3000 + 2.5% × 2500 + 2.5% × 2000 + 2.5% × 1500 + 2.5% × 1000 + 2.5% × 500)
= Tk. 2.5% × 27500 =Tk. 687.5 Tk. Answer:687.5 Tk

❖IBBL ATO/CASH -2017 English Version

1.The length of a rectangle flower garden is 60 meter & breadth is 40 meter.For nursing the garden,there has two concrete crossroads with 5 meter width all along its length and the breadth right at the middle of garden[IBBL ATO/CASH -2017 English Version]
a)Determine the area of the road?

Solution:
Length of the garden=60 meters
Breadth of the garden=40 meters
[Where the two roads cross each other which length=width= 5 meters]

We know,
The area of the road
= (Length of garden*Length of crossroad)+ (Breadth of garden*Width of crossroad)- (Length of crossroad* Width of crossroad)

={60*5+40*5-5*5}
= 475 sq.meters.

b)How much cost to build with cement two concrete crossroads ;if each square meter is required tk 240 ?
Solution:
Cost of two concrete crossroads
=Tk.(475*240)=Tk.114000

Ans: a) 475 sq. meters ;
b) Tk.114000

2.A merchant sold a article for Tk 482 there is a certain amount profit and sold the same article for Tk 318 loss incur equal to the previous profits.What is the selling price of the article,If the merchant sold the article at 40% profits?
[IBBL ATO/CASH -2017 English Version]
Solution:
Cost of the Article is =Tk. X
Sold the article for Tk 482, Profit=Tk.(482-x)
Sold the article for Tk 318, Loss=Tk.(x-318)
[Profit=Loss]
According to the question,
(482-x)= (x-318)
So, x=400
At 40% profits on cost price then Selling price
=400*140/100= Tk.560 Ans: Tk.560

Agrani Bank Senior Officer-2017

1.A dishonest merchant make a 15% profit at the time of buying and a 10% loss at the time of selling the goods. By doing so if the said merchant made a profit of Tk. 3500 on a particular item, what was the real cost of the item sold
[Agrani Bank Senior Officer-2017]
Solution-1:
Let,
Cost Price=X Tk
15% profit on cost price
Then market price=X + X of 15%
=1.15 X Tk
Again 10% loss on market price
Then Selling price
=1.15x -1.15x of 10%
=1.035x Tk
Now profits=Selling - Cost Price
=(1.035x - x) Tk
=0.035x Tk
When,
Profit.035x Tk then Cost Price=X Tk
--------3500Tk-------------------------
=[(3500*x)/.035x]
=1,00,000 Tk
Answer:1,00,000 Tk

Solution-2
Let, cost price = 100 Tk.
At 15% profit the market price of the product will be=100+15=115 Tk.
At 10% loss, the sales price will be=115-(115*10%)=Tk. 103.5 Tk.
So profit = 103.5-100= 3.5 Tk.
Now,
when profit 3.5 Tk. then cost 100 Tk.
when profit 3500 Tk. then cost (100/3.5)*3500=1,00,000 Tk.
So, real cost is Tk. 1,00,000 (Ans.)

2. A alone can do a piece of work in 30 days,while B alone can do it in 15 days & C alone can do it in 10 days.If in every second day B and in every third day C help A in doing the work,how many days will be required to complete the whole work?

[BKB SO-2015][Agrani Bank SO-2017]
Solution:1
Let,
Total work=1 portion
LCM of 2 & 3=6
Per 6 days A work= 6 days

Per 6 days B work=(6/2)=3 days
Per 6 days C work=(6/3)=2 days
So,
6 days (A+B+C)'s work
=(6/30+3/15+2/10) portion
=3/5 portion
Remaining work
=(1-3/5) portion
=2/3 portion
After 2 days(A+B)'s work
=(2/30+1/15)portion
=2/15 portion
[Every second days B help A]
Remaining work
=(2/5-2/15) portion
=4/15 portion
Total time=(6+2)=8 days
9th day(A+C) work
=(1/30+1/10) portion
=2/15 portion
Remaining work
=(4/15-2/15)portion
=2/15 portion
Another 2 days(A+B)'s work
=(2/30+1/15) portion
=2/15 portion
Remaining work
=(2/15-2/15)
=0
So total time taken to finish the work=(9+2)=11 days
Answer:11 days
Solution:2
এখানে,
২ ও ৩ এর ল সা গু =৬
বলে প্রথমে ৬ দিনের কাজ বের করব। ক,খ,গ একত্রে প্রথম ৬ দিনে মোট কাজ করে
=(৬/৩০)+(৩/১৫)+২/১০)
=৩/৫ অংশ
বাকী কাজ =(১-৩/৫)
= ২/৫ অংশ
যেহেতু ২/৩<৩/৫
ক,খ,গ একত্রে পরবর্তী ৩দিনে মোট কাজ করে =(৩/৩০+১/১৫+১/১০) অংশ
=৪/১৫ অংশ
বাকী কাজ=(২/৫-৪/১৫)
=২/১৫ অংশ।

আবার ২/১৫<৪/১৫ বলে
ক পরবর্তী একদিনে যেহেতু ১/৩০ অংশ কাজ করে
তাই বাকী কাজ =(২/১৫-১/৩০)
=১/১০ অংশ
এখন ক, খ একত্রে করবে ১/১০ অংশ কাজ
সুতরাং ক, খ একত্রে ১ দিনে কাজ করে =(১/৩০+১/১৫)=১/১০ কাজ
বাকি কাজ:(১/১০-১/১০)=0

মোট সময় =৬+৩+১+১=১১ দিন
Answer :11 days

3.Two trains ,one from Dhaka and another from chittagong simultaneously started to proceed towards each other at the speed of 16 km and 21 km per hour respectively.As the trains met each other it was found that one train travelled 60 km more than the other.Calculate the distance between Dhaka to Chittagong.[Agrani Bank Senior Officer-2017]
Solution:
Let,
Two trains met each other 't' hrs later
First trair covered=(16*t) km
Second train covered=(21*t)km
Differences of distance two trains
=60 km
According to the question,
21t-16t=60
Or, 5t=60
Or, t=12
Total distance Dhaka to Chittagong
=(16*12+21*12)
=444 km
Answer:444 km

4.Sakib and Labib individually borrowed different amount of money from a particular bank on the same day at rate of 20% simple interest.The total money paid by Sakib in 3 years as principal plus interest was the same amount Labib paid in 2 years as principal plus interest.Find the ratio of their individual loan amount.[Agrani Bank Senior Officer-2017]

[Sonali Bank Senior Officer-2015]
Solution:
Sakib and Labib borrowed amount
X & Y Tk respectively
According to the question,
X+ X of 20%*3=Y+Y of 20%*2
Or,X+0.6 X =Y +0.4Y
Or, 1.6 X=1.4Y Or, X:Y=1.4:1.6 or 7:8
Answer:7:8

5.The perimeter of a square is equal to the perimeter of rectangle. The lenght of the rectangle is three times longer than its width having total area of 1200 sq.meter. what will be the total cost cost if the total area of the square is covered with stones having a dimension of 50 centimeter square each & if tk.50 is charged for placing a stone in the square?
[Agrani Bank Senior Officer-2017]
[Sonali Bank Senior Officer-2015]
Solution:
Let,
Breadth of rectangle=x m
And length of Rectangle= 3x m
According to the question,
$3x^2 = 1200$
x= 20
Length of rectangle = 60m
Perimeter of rectangular
= 2(60+20)=160m
As per question,
Perimeter of rectangular= perimeter of squire = 160m
Side of square = 160/4
=40m or 4000 cm
area of square =(4000*4000)sq.cm
Square of stone
= (50)^2
= 2500 sq.cm
number of stones = (4000*4000)/2500=6400
Total cost = 6400*50=320000
Answer:3,20,000 Tk
NOTE:৫০ সে.মি বর্গ অর্থ বর্গের একটি বাহুর দৈঘ্য ৫০ সে.মি।

❖SBC AM-2016

1.একজন দোকানদার ৬% লাভে একটি দ্রব্য বিক্রয় করিল। যদি দ্রব্যটির ক্রয়মূল্য ৪% কম হইতো এবং বিক্রয়মূল্য ৪ টাকা বেশি হইতো, তাহা হইলে তাহার ১২.৫% লাভ হইতো। দ্রব্যটির ক্রয়মূল্য কত?

[SBC AM-2016]
Solution:
৬% লাভে বিক্রয়মূল্য
=(১০০+৬) =১০৬টাকা
এবং ৪% কমে ক্রয়মূল্য
=(১০০-৪) = ৯৬ টাকা
১২.৫% লাভে বিক্রয়মূল্য,
ক্রয়মূল্য ১০০ টাকা হলে বিক্রয়মূল্য ১১২.৫ টাকা
ক্রয়মূল্য ১ টাকা হলে বিক্রয়মূল্য ১১২.৫/১০০ টাকা
ক্রয়মূল্য ৯৬ টাকা হলে বিক্রয়মূল্য ১১২.*৯৬/১০০ = ১০৮ টাকা

সুতরাং, বিক্রয়মূল্য এর পার্থক্য
=(১০৮ -১০৬) = ২ টাকা
যখন বিক্রয়মূল্য ২ টাকা বেশি হয় তখন ক্রয়মূল্য = ১০০ টাকা
যখন বিক্রয়মূল্য ১ টাকা বেশি হয় তখন ক্রয়মূল্য = ১০০/২ টাকা
যখন বিক্রয়মূল্য ৪ টাকা বেশি হয় তখন ক্রয়মূল্য = (১০০*৪/২) = ২০০ টাকা

উত্তর : ২০০ টাকা

2: 20 workers can finish a work in 30 days. After how many days should 5 workers leave the job so the work is completed in 35 days?[BKB SO -2017][SBC AM -2016]
Solution:
Let,
After x days 5 men should leave
20 workers do in 30 days 1 part
20. " 1 " 1/30
x " 1 " x/30
Now
worker Remaining=(20-5)=15
Day left = (35-x)
And
Suppose
Total portion of work be =1
then,
20 men in 30 d. do 1 part
1 " 1 " " 1/20*30
15 men 35-x " {15*(35-x)/20*30}
According to the question,
x/30+15*(35-x)/20*30=1
==========
x=15
Answer:15 days

3.2x - (2/x)=3 ,then the value of
$x^2+ 1/ x^2$
Answer:1/4

➢ SBC JO-2016

1. একটি অডিটরিয়ামে সারিতে সজ্জিত মোট ৬১৬টি আসন আছে।প্রতি সারিত আসন সংখ্যা মো সারির সংখ্যার চেয়ে ৬টি বেশি হলে, প্রতি সরিতে আসন সংখ্যা নির্ণয় করুন।[SBC JO-2016]
Total row be x
So, each row contains seat be(x+6)
According to the question,
x(x+6)=616
==========
==========
Or, (x+28)(x-22)=0
Either,
x+28=0
Or, x=-28[It is not acceptable]

Or,
X-22=0
Or, x=22
Hence,Each row contains(22+6)=28 seat
Answer:28

2. প্রতি ডজন কলা ২৪ টাকায় ক্রয় করে প্রতি কুড়ি কি দরে বিক্রয় করলে ২৫% লাভ হবে?[SBC JO-2016]
Solution:
Given that,
12 bananas cost price 24 tk
25% profit selling price 125 tk
Cost price 100 tk then selling price 125 tk
Cost price 24 tk then selling price {(125*24)/100}
=30 tk
So,
12 bananas selling price 30 tk
20 bananas selling price {(30*20)/12}
=50 TK
Answer:50 TK

3. x^2 -(7x/3)-2=0 find the value of x [SBC JO-2016]

Answer: 3 or -2/3

❖Sonali Bank Senior Officer-2014

1.মনিষা ও মাইশা একই ব্যাংক থেকে একই দিনে ২০% সরল মুনাফায় আলাদা আলাদা পরিমাণ ঋণ গ্রহণ করে। মনিষা ৩ বছর পর মুনাফা আসলে যত পরিশোধ করে, মাইশা ২ বছরে মুনাফা আসলে তত পরিশোধ করে । তাদের ঋণের অনুপাত কত?
[Sonali Bank Senior Officer-2014]
সমাধান:
ধরি ,
মনিষা ঋণ নিয়েছিল=x টাকা
মাইষা ঋণ নিয়েছিল=yটাকা
২০% মুনাফায় মণিষার ক্ষেত্রে,
৩ বছরের সুদ
={(২০*৩*x)/১০০}
=৩x/৫ টাকা
এবং সুদাসল={x+(৩x/৫)}=৮x/৫ টাকা

মাইসার ক্ষেত্রে ২ বছেরর মুনাফা,
={(২০*২*y)/১০০}=২y/৫ টাকা এবং
সুদাসল ={(২y/৫)+y}=৭y/৫ টাকা

শর্তমতে,
৮x/৫=৭y/৫
বা, ৮x = ৭y
বা,x:y=৭:৮
ঋণের অনুপাত ৭:৮
উত্তর:৭:৮

2.এক ব্যক্তি মাসিক বেতনে চাকরি করেন। বছর শেষে নির্দিষ্ট Increment (বেতন বৃদ্ধি) পান। ৪ বছর পর তার ৩৫০০ টাকা এবং ১০ বছর পর ৪২৫০ টাকা হলে, তার মাসিক কত টাকা বেতন চাকরি মূরু হয় এবং বার্ষিক Increment কত ?
[Sonali Bank Senior Officer-2014]
মনে করি,
ঐ ব্যক্তি চাকুরি শুরু হয়=x টাকায়
এবং বাষিক increment= y টাকা
৪ বছরে increment হয় =৪y টাকা
১০ বছরে increment হয় =১০y "
x + ১০y=৪২৫০-------(1)
x+ ৪y=৩৫০০----------(2)

(-) ৬ y =৭৫০
বা, y =১২৫

(1) নং এ বসিয়ে পাই,
x+ ৪*১২৫=৩৫০০
বা, x =৩০০০
উত্তর : চাকুরি শুরু হয় ৩০০০ টাকায়,
Increament ১২৫ টাকা।

3.একটি বর্গক্ষেত্রের পরিসীমা একটি আয়তক্ষেত্রের পরিসীমার সমান। আয়তক্ষেত্রের দৈর্ঘ্য প্রস্থের ৩ গুণ এবং ক্ষেত্রফল ১২০০ বর্গমিটার। প্রতিটি ৫০cm বর্গকার পাথর দিয়ে বর্গক্ষেত্রটি বাঁধাতে মোট কতটি পাথর লাগবে ?
[Sonali Bank Senior Officer-2014]
সমাধান:
মনে করি,
আয়তক্ষেত্রের প্রস্থ x মি
আয়তক্ষেত্রের দৈর্ঘ্য ৩x মি

শর্তমতে,
৩$x^২$=১২০০
বা,$x^২$=৪০০
বা,x=২০
সুতরাং,
আয়তক্ষেত্রের প্রস্থ ২০ মি
আয়তক্ষেত্রের দৈর্ঘ্য ৬০ মি
আয়তক্ষেত্রের পরিসীমা
=২(৬০+২০)=১৬০ মি
যেহেতু একটি বর্গক্ষেত্রের পরিসীমা একটি আয়তক্ষেত্রের পরিসীমার সমান

সুতরাং বর্গক্ষেত্রের পরিসীমা =১৬০ মি
এবং বর্গক্ষেত্রের একবাহু ৪০ মি
তাই বর্গক্ষেত্রের ক্ষেত্রফল
=(৪০*৪০)=১৬০০ বর্গমি
প্রতিটি পাথরের দৈর্ঘ্য ৫০ সে.মি
=০.৫ মি.
প্রতিটি পাথরের ক্ষেত্রফল
=(০.৫*০.৫)বর্গমি
=০.২৫ বর্গমি.

সুতরাং প্রতিটি ৫০cm বর্গকার পাথর দিয়ে বর্গক্ষেত্রটি বাঁধাতে মোট পাথর লাগবে=১৬০০/০.২৫ =৬৪০০ টি
উওর:৬৪০০ টি

❖ Sonali Bank Officer-2014

1.১৩.৫% মুনাফায় কত টাকা ৫ বছরে মুনাফা আসলে ৮৩৭৫ টাকা হবে? কত বছরে ঐ টাকা মুনাফা আসলে ১০৪০০ টাকা হবে ?
[Sonali Bank Officer-2014]
Solution:
For 13.5% interest,
Tk. 100 one year interest 13.5 tk
Tk. 100 5 years interest (13.5*5)
=67.5 tk
So, Amount=(100+67.5)=167.5 tk
When amount 167.5 tk then principal 100 tk
When amount 8375 tk then principal={(100*8375)/167.5}
=5000 tk
Second Case:
Amount be =10400 tk
So,Principal=(10400-5000)=5400 tk

Again,
Tk 100 one year interest 13.5 tk
Tk 5000 one year interest
={(5000*13.5)/100}=675 tk
Tk. 675 interest from 1 year
Tk 5400 interest from
=(5400/675)=8 years
Answer: 8 Years
2:এক অসাধু ব্যবসায়ী একটি দ্রব্যের ক্রয় ও বিক্রয় উভয় ক্ষেত্রেই ১০% লাভ করায় তার মোট ৬৩০ টাকা লাভ হয়, তা হলে উক্ত দ্রব্যটির ক্রয়মূল্য কত ছিল?
[Sonali Bank officer -2014]
[Same As SEBL-2015]
Solution-1:
The market price of 1 unit goods be Tk x
So, 100 units of goods =100 x Tk
But ,at the time of buying,the merchant paid 100x Tk and received
=(100 + 100 of 10%)
=110
So, the real cost of 110 units to the merchant
=100 x Tk
At the time of selling,the merchant charged
=110x/100
So,
Sold of 110 units
=110*(110x/100)
=121x Tk
Net profit,
=121x-100x
=21x Tk
According to the question,
21x=630
Or, x =30 Tk
So,
The real cost price of the product
=100*30
=3000 Tk
Answer:3000 Tk

Solution-2:
Let,
Cost Price=X Tk
10% profit on cost price Then market price
=X + X of 10%
=1.1 X Tk
Again 10% profits on market price
Then Selling price

=1.1x + 1.1x of 10%
=1.21x Tk
Now profits=Selling - Cost Price
=(1.21x - x) Tk
=0.21x Tk
When,
Profit .21x Tk then Cost Price=X Tk
--------630 Tk-------------------------
=[(630*x)/.21x]
=3000 Tk

Solution-3:
Let,
Cost Price of the article=100 Tk
10% profit on cost price then
Market price=(100 + 100 of 10%)
=110 Tk
Again,
10% profits on market price then selling price=(110+110 of 10%) Tk
=121 Tk
Now,
Profit=(121-100)=21 Tk
When
Profit 21 Tk then Cost Price=100 tk
--------630 Tk ----------------------------------
=[(100*630)/21]
=3000 Tk
Answer:3000 Tk

Solution-4:====
Short Cut/MCQ Way
Let , Cost Price=100 Tk
10% profits on both way
Profit
=10+10+[(10*100)/100]
=21 Tk
Profit 21 then CP =100 TK
-------630 TK --------=[100*630/21]
=3000 TK
Answer:3000 Tk
3. 21 মিটার দৈর্ঘ্য ও ১৫ মিটার প্রস্থ বিশিষ্ট একটি বাগানের বাইরের চারদিকে ২ মিটার চওড়া একটি পথ আছে। প্রতি বর্গমিটার ২৫ টাকা হিসেবে পথটিতে ঘাস লাগাতে মোট কত টাকা খরচ হবে ?
[Sonali Bank Officer-2014]
Solution:
Length of garden with path
=21+2*2=25 meter

Breadth of garden with path
=15+2*2=19 meter
Area of the garden with path
=(25*19)=475 square meter
Area of the garden without path
=(21*15)=315 square meter
Area of the path =(475-315)=160 meter
Total cost to cover the path with grass
=160*25
=4000 tk
Answer:4000 tk

➢ Sonali Bank Officer(IT)-2016

1.The salary of Lamia and Farzin in the ratio of 7:5 and total of their salary is tk 12000. If their annual increments are tk 200 and 150 respectively. What will be the ratio of their salary after one year?[Sonali Bank Officer(IT)-2016]

solution
Let,
Salary of Lamia=7x
Salary of Farzin=5x
According to the question,
7x+5x=12000
Or,x=1000
So, after one year salary of
Lamia=7*1000+200=7200
Farzin=5*1000+150=5150
Ratio=7200:5150=144:103
Ans:144:103

2. A man is standing on a railway bridge which is 180 meters long. He finds that a train crosses the bridge in 20 seconds and crosses him in 8 seconds. Find the length of the train and its speed. [Sonali Bank Officer(IT)-2016]
solution-1:
Actually The Train
(20-8)=12 second goes 180 meters
So, The 20 sec goes=[(180*20)/12]
=300 meter
So,Length of train
=(300-180)=120 meter
And
Speed of train
=(120/8)m/s
=[(120/8)*18/5]km/hr=54 km/hr Answer:120 meter & 54 km/hr

Solution-2:
Let,
Length of the train =x
According to the question,
(180+x)/20=x/8
=>20x=144+8x
=>12x=1440
=>x=120
Solving equation x=120
Speed=[120*3600/8]
=54000 meter
=54 km
So length =120 meter
speed =54 km/hr
Answer:120 meter & 54 km/hr

3. A man goes upstream at 10 km hr to a place and back downstream to same point at 6 km/hr. What is his average sped his journey
[Sonali Bank Officer(IT)-2016]

Solution
Let, distance =30 km [LCM of 10 & 6]
Upstream time
=30/10
=3 hours
Downstream time
=30/6
=5 hours
Total distance
=30+30=60 km
Total time=5+3=8 hours
Average speed
=60/8=7.5 km/hr
Answer:7.5 km/hr
=========
4. The sum of the present age of father and son is 50 years, when son's age will be equal to the father's present age then the sum of their age shall be 102, what is father's present age?
[Sonali Bank Officer(IT)-2016]
Solution-1:
Let,
Father present age=F years
Son's present age =S years
So,
F+S =50.....(1)
When son age equal to father present age the sum of their age=102 years

Total age increased=(102-50)
=52 years
Individual age increased
=52/2=26 years
After 26 years later son's age equal to father age
According to the question,
S+26=F
or, F-S=26-----(2)
from Equations 1 & 2
Father =38 years
Son =12 years
Answer:38 years

Solution-2:
Let,
father's age=x
son's age=50-x
Difference of their age=x-(50-x) =2x-50
So after 2x-50 years son age will be equal to father's present age
According to the question,
x+x+2x-50=102
=>x=38
So father's age=38 years
son's age=50-38=12 years
Answer:38 years

5. By selling a table for tk 39 gain is as much percentage as its cost. what is the cost price? [Sonali Bank Officer(IT)-2016]
Solution:
Let,
Cost price =x
x% gain selling price = x×x/100
According to the question,
x+ x*x/100=39
=> 100x+x^2 =3900
=> x^2+130x-30x-3900=0
=> (x+130)(x-30)=0
So, x=-130 [Not accepted]
or
x-30=0
So x=30 The cost price 30 Tk Answer:30 Tk

❖Sonali Bank SO(IT)-2016

1. A boat takes 3 hours to travel to a certain distance with the stream, and returns to the original place in 5 hours. How long will it take to travel the same distance in stationary water?
[Sonali Bank SO(IT)-2016]
Solution-1:
Let,
Speed of boat in stationary water=x
Speed of current=y
Downstream Speed=(x+y) km/hr
Upstream Speed=(x-y) km/h
We know,
Distance=speed*time
Downstream distance=3(x+y)
Upstream distance=5(x-y)
According to the question,
3(x+y)=5(x-y)
Or,3x+3y=5x-5y
Or,x=4y
Distance=3(x+y)
=3*5y
=15 y
Time taken to the same distance in stationary water
=15y/4y
=3 hrs 45 minutes
Answer:3 hrs 45 minutes

Solution-2:
Let, the speed of the boat = x kmph,
the speed of the stream = y kmph,
and the distance = d km.
According to the question:
x+y = d/3 ---------- (i)
&
x-y = d/5 ---------- (ii)
(i) + (ii) =>
2x = d/3 + d/5 = 8d/15
x = 4d/15
Required time = Distance/Speed = d/x= d/(4d/15) = 15/4 hrs = 3hrs and 45mins.
Ans: 3 hours and 45 minutes.

2. A man has Tk300000. He invests a part of the amount at 8%, and the remaining amount at 10% p.a. At the end of the year he earns a profit of Tk25600 from his entire investment. Find the amount he invested under each rate.
[Sonali Bank SO(IT)-2016]
Solution:
Suppose,
He invested Tk x at 8% rate.
So, He invested Tk (300000-X) at 10% rate.
According to the question,
$0.08X + 0.1(300000-X) = 25600$
Or, $0.08X + 30000 - 0.1X = 25600$
Or, $0.02X = 4400$
Or, $X = 4400/0.02$
Or, $X = 220000$
So, he invested Tk220000 at 8% rate,
and Tk(300000-220000) or Tk80000 at
10% rate.
Ans: Tk220000 at 8%, Tk80000 at 10%.

3.M purchased a 30-inch TV whose height was 18 inches. If the size of a TV is expressed as the lengths of its diagonal, find the width of the TV M purchased.
[Sonali Bank SO(IT)-2016]
Solution:
Let,
The width of the TV = X inches.
According to the question:
$X^2 + 18^2 = 30^2$
Or, $X^2 = 900 - 324$
Or, $X^2 = 576$
Or, $X = 24$
So, the width of the TV is 24 inches.
Ans: 24 inches.

4.The ratio of the girls and boys in a class was 2:5. If two new girls join the class, the ratio becomes 1:2. What was the total number of students in the class?
[Sonali Bank SO(IT)-2016]
Solution:
Let,
the number of girls =2p, the number of boys=5p
And the total number of students in the class=2p+5p=7p
According to the question:
$(2p+2) : (5p) = 1 : 2$
Or, $(2p+2)/(5p) = 1/2$
Or, $5p = 4p + 4$
Or, $p = 4$

So, the total number of students in the class was = 7×4 =28.
Ans: 28

5. How many liters of a solution that is 15% salt must be added to 5 liters of a solution that is 8% salt so that the resulting solution is 10% salt?
[Sonali Bank SO(IT)-2016]
Solution:
Suppose,
X liters of 15% should be added.
According to the question:
15% of X + 5×0.08= 10% of (X+5)
Or, 0.15X + 0.4 = 0.10(X+5)
Or, 0.15X + 0.4 = 0.10X + 0.5
Or, 0.15X- 0.10X = 0.5 - 0.4
Or, 0.05X = 0.1
Or, 5X = 10 Or, X = 2 Ans: 2 liters.

❖South East Bank TO-2016

1. A person invests Tk. 24000 at 7.5% interest annually. How much additional money needs to invest at 10% interest to earn overall interest at 9.25% on entire amount?[SEBL TO-2016]
Solution:
Let, additional amount be Tk. x
According to the question,
7.5% of 24,000+ 10% of x= 9.25% of (24,000+x)
Or,7.5×24,000+10x=9.25(24,000+x)
Or, 180,000 + 10x= 222000+ 9.25x
Or, 10x-9.25x= 222000-180,000
Or, 0.75x= 42000
Or, x= 42000/0.75
Or,x= 56,000
Hence Additional amount is Tk. 56,000. Ans:

2.If 7% of the sale price of a product equal to 8% of cost price and 9% of the sale price exceeds 10% of the cost price by Tk 1, find the amount of profit and cost of the product?
[Dhaka BANK-MTO-2017] [SEBL TO-2016]
Solution:

Let,
Selling price be =X Tk
And
Cost price be =Y Tk
First condition,
7% of X =8% of Y
7x/100=8y/100
Or, x =8y/7----------:--(1)
Second condition,
9%x -10%y=1
Or, (9X/100)--(10Y/100)=1
Or, Y =350
From equations no(1)
X =(8*350)/7
Or, X =400
So,
Selling price of the product is 400 Tk
Profit=(Selling Price--Cost price)
=(400-350)=50 Tk
Answer: Tk.350 & Tk. 50

South East Bank MTO-2016

1. A man's income from interest and wages is Tk 500. He doubles his investment and also gets increase of 50% in wages and his income increases to Tk 800. What was his original income separately in terms of interest wages? [SEBL MTO-2016]

Solution:
Let, original income from Interest=Tk. I and wage=Tk. W
According to the question,
I+W= 500…(i)
2I+1.5W= 800….(ii)
Now,
2×(i)-(ii) =>
0.5W= 200
Or,W= 400

Wage= Tk. 400 and Interest=Tk. (500-100) = Tk. 400
Ans: Tk. 400 and Tk. 100.

2. A book and a pen were sold for Tk. 3040 making a profit of 25% on the book and 10% on the pen. By selling them for Tk. 3070, the profit realizes would have been 10% on the book and 25% on the pen. Find the cost of each. [SEBL MTO-2016]
Solution:
Let, the cost price of pen be X and book be Y
According to the question,
125% of Y + 110% of X P= 3040
Or, 125 Y +110 X = 304000
Or,25 Y + 22 X = 60800……..(i)
And,
110% of Y B + 125% of X = 3070
Or, 110 Y + 125 X = 307000
Or,22 Y +25 X = 61400……. (ii)
Now,
(i)× 25 – (ii)× 22 =>
625 Y + 550 X = 1520000
484 Y + 550 X = 1350800
141 Y = 169200
Or, Y = 1200
Putting the value of Y in equation (i) we get
22×1200 + 25X= 60800
Or, 25X = 60800-30000
Or,X= 30800/25
Or,X= 1400
The cost price of pen Tk. 1400 and book Tk. 1200 respectively
Answer: The cost price of pen Tk. 1400 and book Tk. 1200

Janata Bank EO/FA-2015

Question-01: A depositor deposited 4000 at x% and 5000 at y% and earned 320 as interest. if he could deposit 5000 at x% and 4000 at y% then he would earn 310. what is value of x and y.
[**Dhaka Bank Cash-2018**][**Basic Bank AM-2018] [Janata Bank EO/FA-2015]**

Solution:
According to the question,
4000× x/100+5000×y/100=320
40x+50y=320
Or, 4x+5y=32----------(1)
In the same way
(5000*x)/100+(4000*y)/100=310
Or, 5x+4y=31----------(2)
By doing (1)*5-(2)*4=»
20x+25y=160
20x+16y=124

Or, 9y=36
Or,y=4
Putting value of y in equation (1)
4x + 5*4=32
Or, x=3
So the value of (x,y)=(3,4)

Ans: (3,4)

2: A man goes to his office at a certain time. If his waking speed is 5 kmh then he is 7 minutes late.When his speed is 6 kmh he reaches 5 minutes before. How far his office from his house? [BKB SO -2017] **[Janata Bank EO/FA-2015]**
Solution:
Let,
Total distance between home to office be X km
According to the Question,
X/5 -7/60 =x/6 +5/60 [Time=distance/Speed]
Or, X/5 - x/6 = 5/60 + 7/60
∴ X= 6 km
Answer: 6 km

3.Solve The problem: $\frac{3}{x+1}+\frac{6}{2x+1}=\frac{18}{3x+1}$

$$\frac{3}{x+1}+\frac{6}{2x+1}=\frac{18}{3x+1}$$

Or $\frac{3}{x+1}+\frac{6}{2x+1}=\frac{18}{3x+1}$

Or $\frac{3}{x+1}+\frac{6}{2x+1}=\frac{9}{3x+1}+\frac{9}{3x+1}$

Or $\frac{3}{x+1}-\frac{9}{3x+1}=\frac{9}{3x+1}-\frac{9}{2x+1}$

Or $\frac{3(3x+1)-9(x+1)}{(x+1)(3x+1)}=\frac{9(2x+1)-6(3x+1)}{(3x+1)(2x+1)}$

Or $\frac{9x+3-9x-9}{(x+1)(3x+1)}=\frac{18x+9-18x-6}{(3x+1)(2x+1)}$

Or $\frac{-6}{(x+1)(3x+1)}=\frac{3}{(3x+1)(2x+1)}$

Or $\frac{-2}{(x+1)(3x+1)}=\frac{1}{(3x+1)(2x+1)}$

Or $\frac{-2}{x+1}=\frac{1}{2x+1}$

Or $(x+1)\times 1=-2(2x+1)$

Or $x+1=-4x-2$

Or $x+4x=-2-1$

Or $5x=-3$

Or $x=\frac{-3}{5}$

∴ $x=\frac{-3}{5}$

Ans: $x=\frac{-3}{5}$

4:Find the value of x^4+1/x^4 ;if $x=\sqrt{5}-\sqrt{4}$

Give the, $x=\sqrt{5}-\sqrt{4}$ ———————— (I)

Now, Reversing Equation ———————— (I)

$\frac{1}{x}=\frac{1}{\sqrt{5}-\sqrt{4}}$

Or $\frac{1}{x}=\frac{(\sqrt{5}+\sqrt{4})}{(\sqrt{5}-\sqrt{4})(\sqrt{5}+\sqrt{4})}$

Or, $\frac{1}{x}=\frac{(\sqrt{5}+\sqrt{4})}{(\sqrt{5})^2-(\sqrt{4})^2}$

Or, $\frac{1}{x} = \frac{\sqrt{5}-\sqrt{4}}{5-4}$

Or, $\frac{1}{x} = \sqrt{5} + \sqrt{4}$ ———————— (II)

$\{(\mathrm{I}) + (\mathrm{II})\}$ $Wehave$

$x + \frac{1}{x} = (\sqrt{5} - \sqrt{4}) + (\sqrt{5} + \sqrt{4})$

Or, $x + \frac{1}{x} = \sqrt{5} - \sqrt{4} + \sqrt{5} + \sqrt{4}$

$\therefore x + \frac{1}{x} = 2\sqrt{5}$ ———————— (III)

Now,

$$x^4 + \frac{1}{x^4} = (x^2)^2 + \left(\frac{1}{x^2}\right)^2$$

$$= \left(x^2 + \frac{1}{x^2}\right)^2 - 2x^2\frac{1}{x^2}$$

$$= \left(x^2 + \frac{1}{x^2}\right)^2 - 2$$

$$= \left\{(x)^2 + \left(\frac{1}{x}\right)^2\right\}^2 - 2$$

$$= \left\{\left(x + \frac{1}{x}\right)^2 - 2x\frac{1}{x}\right\}^2 - 2$$

$$= \left\{\left(x + \frac{1}{x}\right)^2 - 2\right\}^2 - 2$$

$$= \left\{\left(2\sqrt{5}\right)^2 - 2\right\}^2 - 2$$

$$= (20-2)^2 - 2$$

$$= (18)^2 - 2$$

$$= 324 - 2$$

$$= 322$$

Ans: 322

❖Bank Asia MTO/PO-2015

1.A dishonest merchant make a 10% profit at the time of buying and a 5% loss at the time of selling the goods. By doing so if the said merchant made a profit of Tk. 900 on a particular item, what was the real cost of the item ?[Bank Asia PO/MTO-2015]

Solution:
Let, cost price = 100 Tk.
At 10% profit on cost price then market price of the product will be=100+10=110 Tk.
At 5% loss, the sales price will be=110-(110*5%)=Tk. 104.5 Tk.
So profit = 104.5-100= 4.5 Tk.
Now,
when profit 4.5 Tk. then cost 100 Tk.
when profit 900 Tk. then cost {(100/4.5)*900}=20,000 tk
So, real cost is 20,000 tk(Ans.)

Note:Multiple solution see Sonali Bank

2.What will be the deposited amount at initial stage,if it becomes tk 43,750 the end of 5 years with a simple interest rate of 15% per annum?How many years it will take the same deposite amount to become tk 55,000 tk? [Bank Asia PO/MTO-2015]

15% interest rate 5 years interest be =15*5=75 tk

So,amount be=(100+75)=175 tk

When amount be 175 tk then principal be 100 tk

When amount be 43,750 tk then principal be{ (100 *43,750)/175}=25,000 tk

Second case,

P=25,000 tk

I=55,000-25,000=30,000 tk and r=15%

So T={(30000*100)/(25000*15)}=8

Answer: 8 Years

❖Faculty of Social Science,DU

Uttara Bank Assistant Officer(Cash)-2018

Question-01:Anik visited his cousin Rowhan during the summer vacation. In the mornings, they both would go for swimming. In the evenings, they would play tennis. They would engage in at most one activity per day, i.e. either they went swimming or played tennis each day. There were days when they took rest and stayed home all day long. There were 32 mornings when they did nothing, 18 evenings when they stayed at home, and a total of 28 days when they swam or played tennis. What duration of the summer vacation did Anik stay with Rowhan? [Uttara Bank Assistant officer Cash-2018]

Solution:
Let
The duration of Anik's vacation be n days.
Given that
On each day, he had engaged in exactly one of swimming and tennis,
Also given that he was free on 32 mornings and
On 18 evenings and on total 28 days he either went for swimming or tennis.
So,
He was busy on (n−32)mornings
And (n−18) evenings
Now we can write,
(n−32)+(n−18)=28
Or, 2n =28+32+18
Or, n=39

So,39 day's summer vacation did Anik stay with Rowhan
Answer: 39 day's

Question-02:In a three digit number the number in unit place is 75% of tenth digit number, the tenth digit number is greater than hundred digit by 1 & their sum will be 15, find out the number? [Uttara Bank Assistant Officer Cash-2018]

Solution:
Let,
Tenth digit be=y
Unit's digit= 75% of y=3y/4
Hundred's digit=y-1
So,
The number be
=100(y-1)+10y+3y/4

=100y-100+10y+3y/4

=(443y-400)/4.....(i)
Now From Question,
y-1+y=15
or,2y=16
or,y=8
Putting the value of y=8 in equation(i)
(443*8-400)/4
=(3544-400)/4
=(3144/4)
=786
Hence,the required number is 786

Answer:786
Solution-2:
Let,
Unit digit=x
Tenth=y
And,
Hundred=z
So,
Original number=100z+10y+x
From question condition,
x= 75% of y=3/4*y-------(i)
And,
y=z+1---------(ii)
Again from question,
y+z=15
Or,2z+1=15
Or,z=7
From equation(ii)
y=8
From (i)& x=3/4*8=6 So,Required number=7*100+8*10+6=786.
Ans:786

❖Uttara Bank PO-2018

Question:From a number of apples a man sells half the number of existing apple plus 1 to the first customer, sells 1/3 of the remaining apple plus 1 to the second consumer, and sells 1/5 of the remaining apple plus 1 to the third consumer. He then finds that he has 3 apples left. How many apples did he have originally? [Uttara Bank PO-2018]
Solution:
Suppose,
The number of apples =x
He sells apples to the first customer
=(x/2+1)=(x+2)/2

Remaining Apples
=x-(x+2)/2
=(x-2)/2
He sells apples to the second customer
=1/3{(x-2)/2}+1
=(x+4)/6
Remaining apples
={(x-2)/2}-{(x+4)/6}
=(2x-10)/6
=(x-5)/3
He sells third customer
=1/5{(x-5)/3}+1
=(x+10)/15
Remaining apples
={(x-5)/3}-{(x+10)/15}
=(4x-35)/15
According to the question,
(4x-35)/15=3
Or, x=20
Answer:20

#Alternative:
Let,number of apples = x
He sells apples to the first customer = x/2+1
He sells apples to the second customer =1/3{x-(x/2+1)}+1
=(x + 4)/6
He sells apples to the third customer=1/5{x-[(x/2)+1)+(x+4)/ 6]+1
=(x+10) /15
Finally, he has 3 apples left then
So,x=(x+2)/2+(x+4)/6+(x+10)/15+3
Or,x ={15(x+2)+5(x + 4)+2(x+10)+ 90}/30
Or,30x=22x+160
Or,8x=160
Or,x=20
The number of apples = 20
Answer:20

Question-2:.A farmer sold a cow & Ox for Tk 80,000 and got a profit on 20% on the cow & 25%on the ox.If he sells the cow the cow and the ox for tk.82,000 and got a profit 25% on cow and 20% on the ox. Find the individual cost price of both?[Uttara Bank _PO_2018]
Solution:
Let
Cost price of cow be x tk
Cost price of Ox be y tk
According to the first condition,

120%x + 125% Y=80,000
Or, 120x +125y=80,000*100
Or, 24x+25y=16,00,000.....(i)
Again,Second condition
125%x + 120%y= 82,000
Or, 125x + 120y=82,000*100
Or, 25x +24y=16,40,000----------(ii)
(i)*25-(ii)*24=»
600x + 625y=4,00,00,000
600x + 576y=3,93,60,000

Or, 49y=640000
Or, y=13061.22
Putting the value of y=13061.22 equation (i)=»
24x=1600000-25*13061.22
Or, 24x =1600000-326530.61
Or, 24x=1273469.4
Or,x=53061.22
Answer:53061.22 tk & 13061.22 tk.

Question-3:A train starts from station a with some passengers. At station b, 10% of the passengers get down 100 passengers get in. At station c 50% get down and 25 get in. At station d 50% get down and 50 get in making the total number of passengers 200. How many passengers did board the train at station a? [Uttara Bank PO-2018]
Solution:
Let, x passengers board the train at station A
At Station B,passenger get down
=x of 10%=x/10
Remaining passenger
=(x-x/10)=9x/10
Passenger get in=100
Now total passenger
=(9x/10)+100=(9x+1000)/10

At Station C,
Passenger get down
={(9x/10)+100} of 50%
=(9x+1000)/20
Remaining
={(9x+1000)/10}-{(9x+1000)/20}
=(9x+1000)/20
Passenger get in=25
Now total passenger,
{(9x+1000)/20}+25
=(9x+1500)/20

At Station D:
Passenger get down
=(9x+1500)/20 of 50%
=(9x+1500)/40
Remaining passenger
={(9x+1500)/20}-{(9x+1500)/40}
=(9x+1500)/40
Now total passenger
{(9x+1500)/40}+50
=(9x+3500)/40
According to the question,
(9x+3500)/40=200
Or, 9x=8000-3500
Or, x =500
Answer:500

Bangladesh Bank AD -2017:

1. A man sells an article at a profit of 25%. If he had bought it at 20% less and sold it for Tk. 10.50 less, he would have gained 30%. Find the cost price of the article.
[Bangladesh Bank AD -2017]
Solution:
Suppose,
The cost price of the article is Tk. 100

At 25% profit, selling price
=(100+25% of 100)= Tk. 125

At 20% less, cost price
=(100-20% of 100)=Tk.80

At 30% profit, selling price
=(100+30% of 100)=Tk.130

When CP is Tk 100, SP is Tk.130
When CP is Tk 80, SP is (130*80/100)=Tk.104

Difference of two selling price
=(125-104)=Tk.21

When SP difference is Tk. 21 less, CP is Tk.100
When SP difference is Tk. 10.50 less, cost price is {(100*10.50)/21}
= 50 tk

Ans: Tk.50

2. A and B can do a piece of work in 18 days, B and C can do it in 24 days, A and C can do it in 36 days. In how many days will A, B and C finishes it, working together and separately?
[Bangladesh Bank AD -2017
Solution:
(A + B)'s 1 day's work = 1/18
(B + C)'s 1 day's work = 1/24
(A + C)'s 1 day's work = 1/36

2(A + B + C)'s 1 day's work
=1/18 + 1/24 + 1/36=9/72
=1/8 portion of the work
(A +B + C)'s 1 day's work
=1/16 portion of the work

So,(A +B + C) together can finish the work in 16 days.

A's 1 day's work
=1/16 – 1/24
= 1/48 portion of the work
A alone can finish the work in 48 days.

B's 1 day's work
= 1/16 – 1/36
=5/144 portion of the work
B alone can finish the work in 144/5=28.8 day

C's 1 day work
=1/144 portion of the work
C alone can finis e work in 144 days

❖Janata Bank Executive Officer-2017

01.A number when divided successively by 4 and 5 leaves remainders 1 and 4 respectively. When it is successively divided by 5 and 4, what will be the respective remainders?
[Janata Bank EO-2017][Indian Bix,GMAT]
Solution:
Math Fact:What is Successive division?
[Successive division মানে হলো প্রথমে মূল সংখ্যাটিকে একটি ভাজক সংখ্যা দ্বারা ভাগ করা এবং এই ভাগ প্রক্রিয়া থেকে যে ভাগফল পাওয়া গেল তাকে দ্বিতীয় একটি ভাজক সংখ্যা দ্বারা ভাগ করা।]
Solution:
Let
The number be P
Quotient be X
First case
when divided by 4 quotient is X and remainder is 1
So P= 4x+1.....(1)
Second case
Let Quotient be M
when divided by 5 quotient is
M and remainder is 4
X=5M+4
Putting X=5M +4 equation no (1)
P= 20M+17
considering M= 1,2,3,4.....
P= 37,57,77....
37 or 57 or 77 etc number when divided successively 5 & 4 Remainder always 2 & 3
So respective remainder is 2 and 3
Answer:2,3
========Proof(প্রমান):==========
**37/4
Remainder=1 & quotient=9
And
9/5
Remainder=4
So first condition is proof
Second case ====
37/5
Remainder=2 & Quotient=7
And
7/4
Remainder=3
So Answer:2,3

02:A contractor undertakes to do a piece of work in 40 days. He engages 100 men at the beginning and 100 men after 35 days and completes the work in stipulated time. If he had not engaged the additional men, how many days behind schedule would it be finished?
[Janata Bank EO-2017][Same as PBL JO MCQ-2014]

Solution:
100 Men 40 days done 1 portion W
100 Men 35 days done 35/40«»«»«
=7/8 portion
Remaining work=(1-7/8)
=1/8 portion
Remaining days=(40-35)=5 days
Total worker=(100+100)=200
200 worker 1/8 portion done 5 day
1========1/8========== 5*200
100======1/8=========(5*200/100)=10 days
If he had not engaged the additional men,Then he needed
(10-5)=5 days more to finish the whole work in stipulated time
Answer: 5 days

04:In a certain office, 1/3 of the workers are women, 1/2 of the women are married and 1/3 of the married women have children. If 3/4 of the men are married and 2/3 of the married have children, what part of the workers are without children?
[Janata Bank EO-2017][MTB MTO MCQ -2013]
Solution:
Let,
The number of workers in the office is x
Female=x/3
Female + Married=1/2 of x/3=x/6 portion

Female + Married+ Children
=(1/3 of x/6)
=x/18 portion
From question,
Male=(x-x/3)=2x/3 portion
Male + Married
=3/4 of 2x/3
=x/2 portion
Male + Married+ Children
=(2/3 of x/2)
=x/3
Total worker with children
=x/3+x/18
=7x/18 portion

Total worker without no children
=(x-7x/18)
=11x/18
Required worker no children
=(11x/18)/x=11/18 Answer:11/18

05:The average weight of three men A, B, and C is 84 kg. Another man D joins the group and the average now becomes 80 kg. If another man E, whose weight is 3 kg more than that of D, replaces A, then the average weight of B, C, D and E becomes 79 kg. What is the weight of A?
[Janata Bank EO-2017][RAKUB SO-2014][AB Bank -2002][Al Arafa Bank-2016]
[Meghan Bank-2014]
[Premier Bank-2010]
[One Bank-2008]
Solution:
The sum of Weight
A+B+C = 84×3 = 252 kg------(1)
If D join,total Weight of
A+B+C+D = 80×4 = 320 kg----(2)

So, the weight of D
=320 - 252 = 68 kg

And weight of E = 68+3 = 71 kg
Again, the sum of Weight of B+C+D+E = 79×4 = 316 kg
Weight of B+C+68+71 = 316 kg
B+C = 316-139 =177 kg
Putting the value of (B+C) equation no (1)
A+B+C=252
Or,A+177=252
Or, A=(252-177)=75
Answer: 75 kg

Bangladesh Bank Officer(Cash)-2017

1. If 9 engines consume 24 metric tons of coal, when each is working 8 hours a day, how much coal will be required for 8 engines, each running 13 hours a day, it being given that 3 engines of former type consume as much as 4 engines of latter type?
[BB Officer(Cash)-2017]
Solution:
According to the question,
3 Engine former = 4 Engine later.
1 Engine former = 4/3 of later

So, 9 Engine of former =(4*9/3)
=12 Engine of later type

12 engine later type each working 8 hrs a day consume 24 metric tons coal
So,
8 engine later type each working 13 hrs a day consume
={(24*8*13)/(12*8)}
=26 metric tons

Answer: 26 metric tons

2.Shakil started a business investing Tk. 25000 in 2009. In 2010, he invested an additional amount of Tk. 10000 and Raihan joined him with an amount of Tk. 35000. In 2011, Shakil invested another additional amount of Tk. 10000 and Jafor joined them with an amount of Tk.35000. What will be Raihan's share in profit of Tk. 150000 earned at the end of 3 years from the start of the business in 2009?[BB Officer(Cash)-2017]
Solution:
According to Question,
Shakil Investment Amount in 3 years
=(25000×3+10000×2+1000×2) =105000 Tk
Raihan Investment Amount in 2 years
=(35000×2) Tk
= 70000 Tk
Jafor Investment Amount in 1 years
=(35000×1) Tk
= 35000 Tk
Now their Investment Ratio
=105000: 70000: 3500
= 3:2:1
Sum of their Investment Ratio
=(3+ 2 + 1)
= 6
Raihan’s Profit share
=(150000×2/6)
= 50000 Tk
Answer: 5000 Tk

3.Dawood invested certain amount in three different schemes A, B and C with the rate of 10% p.a., 12% p.a. and 15% p.a. respectively. If the total interest accrued in one year was Tk. 3200 and the amount invested in Scheme C was 150% of the amount invested in Scheme A and 240% of the amount invested in Scheme B, what was the amount invested in Scheme B ?[BB Officer(Cash)-2017]
Solution:
Let,

A's investment was x Tk
From question conditions,
C' investment was
=150% of A
=(150/100) of X
=3x/2 Tk
And
C =240% of B
Or, 3x/2=(240/100) of B
Or, B =5x/8
According to the question,
10%of x+(5x/8)of 12%+(3x/2)of 15%=3200
Or, (10x/100)+(12*5x)/(8*100)+(15*3x)/(2*100)=3200
Or, x =8000
The amount of B invested in the scheme
={(5*8000)/8}
=5,000 Tk
Answer: Tk 5000

Bangladesh Bank IT-2016

1.10% of the voters did not cast their vote in an election between two candidates.10% of the votes polled were found invalid.The successful candidate got 54% of the valid votes and won by a majority of 1620 votes.Find the number of voters enrolled on the voters list.
[Bangladesh Bank IT-2016].
Solution:
Successful candidate gots=54%
Other candidate got=(100-54)=46%
Successful candidate got majority
=(54-46)%
=8%
According to the question,
8%----------=1620
100%----------=[(1620*100)/8]
=20250
Invalid vote=10%
So valid vote=(100-10)=90%
Now,
90% vote =20250
And 100% vote=[(20250*100)/90]
=22500
From question Did not cast vote=10%
Cast vote=(100-10)=90%

So,
90% cast vote=22500
100% or total voters
=[(22500*100)/90]
=25,000
Answer:25,000

2.Two friends P and Q started a business investing in the ratio of 5: 6 R joined them after six months investing an amount equal to that of Q 's .At the end of the year ,20% profit was earned which was equal to tk 98000.What was the amount invested by R?
[Bangladesh Bank IT-2016]
Solution-1:
Suppose,
The total profit be z Tk
Then,
20% of z = 98000
Or, z =(98000∗100)/20
Or, z= 4,90,000
Total profit after one year =4,90,000 Tk
Let ,
the capitals of P, Q and R be
5x, Rs. 6x and Rs. 6x respectively.
Then,
5x*1+6x*1+6x * 1/2= 490000
Or, (10x +12x+6x)/2=490000
Or,28x=490000*2
Or, x=35000
So, R's investment=(6*35000)
=210000 Tk
Answer:210000 Tk

Alternative:

Suppose,
The total profit be z Tk
Then,
20% of z= 98000
Z= (98000∗100)/20
Or,z= 4,90,000
Let ,
the capitals of P, Q and R be
5x, Rs. 6x and Rs. 6x respectively.
Then,
(5x * 12)+(6x * 12)+(6x * 6)= 490000 * 12
Or,168x = 490000 * 12

Or, x = (490000∗12168)
= 35000
R's investment = 6x =(6 * 35000) =210000 Tk

Answer:2,10,000 Tk

Bangladesh Bank AD-2014

1:a, b, c, d, e are 5 consecutive numbers in increasing order, deleting one of them from the set decreased the sum of the remaining numbers by 20% of the sum of 5. Which one of the number is deleted from the set?
[Bangladesh Bank AD-2014][Bangladesh Bank AD-2012][PBL SO-2013]
Solution:
Since a,b,C,d,e are increasing order consecutive number
b=a+1
c=a+2
d=a+3
e=a+4
The sum of five numbers
=a+a+1+a+2+a+3+a+4
=5a +10
Now we are given that the sum decreased by 20% when one number was deleted
Hence,
The new sum should be
=(5a+10)-20% of(5a+10)
=4a+8
Now,
New sum
=old sum- Dropped number
4a+8=5a+10-Dropped number
Dropped number=a+2=C
Answer:C

Alternative

Let, the consecutive numbers are,
a =1
b = 1 + 1 = 2
c = 1 + 2 = 3
d = 1 + 3 = 4
e = 1 + 4 = 5
So, Total = 1 + 2 + 3 + 4 + 5 = 15
Deleting one of the five numbers from the set then decreased 20% of the sum.
20% of the sum
=(15 x 20)/100

=3
So, the deleted number is the 3rd as c from the set
Answer :C

Alternative

Let,
C=x. b=x-1. a=x-2
d=x+1
e=x+2
Sum=x-2+x-1+x+x+1+x+2
=5x
Suppose,

The deleted number was=p
According to the question,
P=20% of 5x
P=x
Answer:C

2.Rahim bought 2 varieties of rice costing tk 5 & 6 per kg each. Then he sold the mixture at tk7/kg, making profit of 20%. What was the ratio of the mixture? [Bangladesh Bank AD-2014]

Solution:
Let,
Rahim bought x kg rice at tk 5 & y kg rice at tk 6/kg
So, total cost =(5x + 6y) Tk
Selling price = (7x + 7y) Tk
20% profit = 20% of(5x + 6y)
= (5x + 6y)/5
According to question,
Selling price -Cost price =Profit
(7x + 7y) - (5x + 6y) = (5x + 6y)/5
Or, 2x + y = (5x + 6y)/5
Or, 10x + 5y = 5x + 6y
Or, 5x = y
Or, x/y = 1/5
Answer :1:5

Alternative

Let,
Rahim bought x kg rice at tk 5 & y kg rice at tk 6/kg
So, total cost =(5x + 6y) Tk
Selling price = (7x + 7y) Tk
According to the question,
(7x+7y)=120% of (5x +6x)
==========
==========

Or, x/y=1/5
The ratio of the mixture=1:5
Answer:1:5

Alternative:

Preliminary Way
20% profit
Cost price=(100*7)/120
=70/12
5::::::::::::::::::::::::::::::::::::::6
::::::::::::::70/12::::::::::::::::
[6-70/12]::::::::::::[(70/12)-5]
=2::::::::::::::::::::::::::::::::::10
=1:5
Answer:1:5

3.A team of 2 men and 5 women completed 1/4th of a job in 3 day's. After that another man joined them and they all complete the next 1/4th of the job in 2 day's.How many men can complete the whole job in 4 days? [Bangladesh Bank AD-2014]
Solution:
Here, ln 3 days,
2 men & 5 women do 1/4 part
So, in 1 day 2 men & 5 women do 1/12 part
Again,In 2 days ,
3 men & 5 women do 1/4 part
or in 1 day 3 men & 5 women do 1/8 part
1 man's1 day work={1/8–1/12}
=1/24 part
So, in 24 day's the whole job can be done by 1 man
In 4 days the whole job can be done by = 24/4 = 6 men
Answer:6 men

PBL SO/Officer-2017

1.Twenty-four men can complete a work in sixteen days.Thirty-two women can complete the same work in twenty-four days. Sixteen men and sixteen women started working for twelve days. How many more men are to be added to complete the work remaining work in 2 days? [PBL SO/Officer-2017]
Solution:
Here,
24 men can complete in 16 days 1 portion work
1 man can complete in 1 day=1/(16*24)
=1/384 portion
Again,

32 women can complete in 24 days 1 portion
1 woman can complete in 1 day=1(32*24)
=1/768 portion
Both,
1man +1 woman work in 1 day=(1/384+1/768)
16 men +16 women work 12 days
=[(16*12)/384 + (16*12)/768] portion
=(1/2+1/4) portion
=3/4 portion

Remaining work
=1-3/4
=1/4 portion
Let,
X more men should be added then the remaining work complete in 2 days
Total men =(16+x)
1 man in 1 day done=1/384 portion
(16+x) men in 2 days done=(16+x)*2/384 portion

Similarly,
16 women in 2 days done=(16*2)/768 portion

According to the question,
(16+x)*2/384 +32/768=1/4
Or,(32+2x)/384=1/4-32/768
Or,(32+2x)/384=(192-32)/768
Or,(32+2x)/384=160/768
Or, 32+2x=160/2
Or,2x=80-32
Or,2x=48
Or, x=24
Answer:24 men

2.The average speed of Train in the onward Journey is 25% more than that is the return journey .The train halts for an hours on reaching the destination. The total time taken for the complete journey to and fro17 hours, covering a distance of 800 km. Find the speed of the Train is the onward journe?
[PBL SO/Officer-2017]
Solution:
Let,
Return speed of the train is x kmh
So,
Onward speed of the train be(x+x of 25%) =5x/4
The train halts for an hour

So,Actual time taken the train
(17-1)=16 hours

According to the question,
400/x + 400/(5x/4)=16
Or,400/x +400*4/5x=16
Or,(400*5+400*4)/5x=16
Or,x=(400*9)/(16*5)
Or, x=45

So, Onward speed of the train is =5x/4
=(5*45)/4
=56.25 kmh
Answer:56.25 km/h

➢ PBL TAT-2017

1.The population of a town increased from1,75,000 to 2,62,500 in a decade.Find the average percent increase of population per year is?[PBL TAT -2017]
Solution:
Population increased in a decade or 10 years
=262500-175000
=87500
Per year increased
=(87500/10)
=8750

Required percentage
={(8750*100)/175000}
=5%
Answer:5%

2.A,B,C enter into partnership.A invests 3 times as much as B invests two-third of What C invests. At the end of the year, the profit earned is Tk 6600.What is the share of B?
[PBL TAT -2017]
Solution:
Let,
The amount of investment of C be Tk. x
So,
The amount of investment of B be
Tk (2x/3)
The amount of investment of A be
=(3*2x/3)

=Tk 2x
The ratio of investment of A,B & C
=2x:2x/3:x
=6:2:3
Sum of the ratio=6+2+3=11
So,
The amount of share
=(66000*2/11)
=Tk.1200
Answer:1200 Tk

PBL SO/OFFICER-2016

01.A room is half as long again as it is broad. The cost of carpeting the room at Tk. 5 per sq.m is Tk.270 and the cost of papering the four walls at Tk.10 per sq.m is Tk.1720. If a door and 2 windows occupy 8 sq.m.Find the dimensions of the room.
[PBL SO/OFFICER-2016]
Solution:
Let,
Breadth of room= x
Length of room= (x+x/2) = 3x/2
Area of floor
= Total carpet cost/ rate
= 270/5
= 54 square meter
According to the question,
3x*x/2 = 54
x = 6
From the equation we find,
Breadth = 6m
Length= 3*6/2 = 9m
Now,
Papered area,
= (1720/10) sq. km
= 172 sqm
So,
Area of one door and two window = 8 sq.m
Total area of 4 walls
= (172+8)
= 180 sq.m.
Now,
Area of four wall
=[2(length+breadth)]*height

2(6+9)*h = 180
30h = 180
h = 6
So,
Breadth= 6m
Length= 9m
Height = 6m
Answer: 6,9 & 6 meter

02.Four milkmen rented a pasture. A grazed 24 cows for 3 months, B 10 cows for 5 months, C 35 cows for 4 months and D 21 cows for 3 months. If A 's share of rent Tk 720.Find the total rent.
[Pubali Bank Senior Officer/Officer-2016]
Solution:
A grazed 24 cows for 3 months,
So A's share of rent is (24*3)=72
B grazed 10 cows for 5 months,
So B's share of rent is (10*5)=50
C grazed 35 cows for 4months,
So C's share of rent is (35*4)=140
D grazed 21 cows for 3 months,
So A's share of rent is (21*3)=63
Total share=(72+50+140+63)=325
Given that,A's share is Tk 720
Let,Total rent be x tk
So,
72x/325=720
Or, x=3250 tk
Answer:3250 tk

03.A certain sum of money amounts to Tk. 1008 in 2 years and to Tk.1164 in 3 ½ years. Find the sum and rate of interest. [Pubali Bank Senior Officer/Officer-2016]
Solution:
In 3.5 years sum of money amounted to= Tk.1164
In 2 years sum of money amounted to = Tk.1008
Hence, in (3.5-2)=1.5 years interest = (1164-1008)= Tk.156
in 1 year interest =Tk. 156/1.5

= Tk. 104

So, Sum = 1008-(104×2)

= Tk. 800

We know, I=pnr/100

Or,r =100I/pn

Or,r=(100*104)/(800*1)=13

Hence, Rate of interest= 13% Ans: Tk. 800 and 13%.

PBL CASH-2016

01.The simple interest on a certain sum of money for 2.5 years at 12% per annum is Tk. 40 less than the simple interest on the same sum for 3.5 years at 10% per annum. Find the sum. [PBL CASH-2016]
Solution:
Suppose,
Sum be = x Tk
According to the question,
(3.5*10%)*x - (2.5*12%)*x = 40
Or, 35x-30x = 4000
Or,5x = 4000
Or,x = 800
Answer:800 Tk

Solution-2:
Effective rate of interest for 3.5 years=3.5*10=35%
Effective rate of interest for 2.5 years=2.5*12=30%
Difference of interest rate=35-30=5%

Now, 5% is.....40
Then, 100% is.....40*100/5
=800 (Ans.)

02.A, B and C started a business by investing Tk 1,20,000, Tk. 1,35,000 and Tk. 1,50,000 respectively. Find the share of each out of an annual profit of Tk. 56,700[PBL CASH-2016]
Solution:
Ratio of their investment:
A,B & C=120000:135000:150000
=120: 135: 150
=8: 9: 10
Sum of their Ratio= 8+9+10=27
Share of profit;

A=(56700*8/27) = 16800 Tk
B=(56700*9/27) = 18900 Tk
C=(56700*10/27)=21000 Tk
Answer: 16800, 18900 & 21000 Tk

03. A retailer buys 40 pens at the market price of 36 pens from a wholesaler. If he sells these pens giving a discount of 1%, what is the profit percent?
[PBL CASH-2016]
Solution:
Let,
40 of pens cost price=36 SP =x Tk
cp of each pen =x/40 Tk
sp of each pen=x/36 Tk

Deducting 1% discount, sp
= 99%*x/36
=99x/3600

profit =99x/3600 - x/40
=9x/3600

Profit percentage
=[(9x/3600)/(x/40)]*100
=10%
Answer:10%
Alternative Solution:
Let, Market price of each pen be Tk.100,
So, market price of 36 pens
=Tk. 3600
Then, Buying price of 40 pens =Tk.3600
So, Buying price of each pen
= 3600/40
=Tk.90
At 1% discount, SP =99% of 100
=Tk. 99
So, Profit =99 –90
=Tk. 9
Profit %=9*100/90
=10%(Ans)

PBL SO/O-2014

30.When a producer allows 36% commission on the price of his product, earns a profit of 8.8% what would be his profit percent if the commission is reduced by 24%?[PBL SO/O-2014]
Solution:
Let,
cost price of the product=Tk.100
8.8% profits on cost price then
Selling price of product
=(100+100 of 8.8%)=108.8 Tk
36% commission on cost price then Selling=(100-100 of 36%)=64 Tk
When
SP is 108.8 Tk then cp=100 Tk
SP-----64----------=(100*64)/108.8
=58.82 Tk
If the commission is reduced by 24% then actual commission gave
=(36-34)=12%
12% commission on cost price then Selling price=(100-12)=88 Tk
Profit=(88-58.82)=29.18 Tk
Now,
Profit percent he got
=[(29.18*100)/58.82]=49.6%
Answer:49.6%

❖Faculty of BIBM

Modhumoti Bank Probationary Officer-2018

Question-01:Mr B invests Tk 2400 in the bank at 5% interest.How much additional money must be invested at 8% interest so that the total interest will be equal to 6% of his entire investment?[Modhumoti Bank PO-2018]

Solution

Suppose,

Mr B Additional money invested be x tk

According to the question,

8% of x + 5% of 2400 = 6%(x+2400)

Or,8x+12000 = 6x+14400

Or,2x = 2400

Or,x = 1200

Mr B Additional money invest is 1200 tk

Answer:1200 TK

Question-2:A salesman is paid a monthly salary of tk 15000 plus 12.5% commission on all of his sales .What should be his total annual sales in TK so that his annual earning from salary and commission is tk 265000 ? [Modhumoti Bank PO-2018]

Solution:

Given that,

Monthly salary=15000 tk

So, Annual salary

=(15000*12)

=180,000 TK

So ,Annual commission he got

=(265000-180000) TK

=85000 TK

Suppose,

His annual sales be x tk

According to the question,

12.5% of x=85000 tk Or, x=680000 tk Answer:6,80,000 TK

Question-3:The perimeter of a square field is equal to the perimeter of a rectangle field.Length of the rectangle fields is 3 times of its width and the area is 768 square meter.How many square sized tiles of 80 centimetre wide will be required to cover the square field?
[Social Islamic Bank-PO-2017] [Modhumoti Bank PO-2018]
Solution:
Let,
The width of the rectangle be x meter
So,
The length of the rectangle be 3x meter
According to the question,
3x*x=768
0r, x =16
So,
The perimeter of the rectangle,
=2(3*16+16)
=128
So, the perimeter of the square is 128 meters
Suppose,
Each Side of square is a
From question,
4a=128
Or, a =32
Area of the square is
$=(a)^2$
$=(32)^2$
=1024 square meter
=10240000 square cm
Area of the tiles
=(80*80) square cm
=6400 square cm
Number of tiles
=10240000/6400=1600 piece Answer:1600

Question-4:Solve the equation: [Modhumoti Bank PO-2018]

$4/(2x+1)+9/(3x+2)=25/(5x+4)$

Solution:

$4/(2x + 1)+\{9/(3x+2)\}= 25/(5x+4)$

Or,$4/(2x+1)= 25/(5x+4)- \{9/(3x+2)\}$

Or,$4/(2x+1)=(30x+14)/(5x+4)*(3x+2)$

Or,$60x^2+58x+14 = 60 x^2+88x+32$

Or,$30x = -18$

Or,$x = - 3/5$

Answer:(-3/5)

Modhumoti Bank Probationary Officer-2017

01:A shirt sold at 6% profits.If the purchase price was 4% less and selling price was Tk 4 more,the profit be 12.5%.What was the purchase price of the shirt.
[MODHUMOTI BANK PO-2017]
#More Written Exam Same As*
[Bangladesh Bank AD-2017][SBC AM -2016]
[BKB -2012][NBL-2014][BCS Written]
[Non cader Written][INDIAN BIX]
[BAPEX][Islamic Bank-2013]
[BRC-2008]
*So on
#Preliminary Exam:
*16th BCS
*MBA-2007-08;1999;1997
*NCC BANK-2002
*PBL-2000
Solutions-1:
Cost price of the article=100 TK
*6% profit first selling price
=(100+100 of 6%)=106TK
*4% less cost price
=(100-100 of 4%)=96 TK
*12.5% profit second selling price
=(100+100 of 12.5%)=112.5 TK
Now,
Cost price TK 100 then Sp=112.5 TK
»»»»»»»»»»»»TK1»»»»»=(112.5/100)TK
»»»»»»»»»»»» TK80»»»»=(112.5*96/100)
=108 TK

Differences of two selling price
=(108-106)=2 Tk
When
TK 2 more then cost price=100 TK
TK4»»»»»»»»»»»»»»»»»»»»=(100*4)/2=200TK
Answer:200TK

Solution-2:
Let,
Cost price be= x TK
First Selling price=(x+x of 6%)
=53x/50TK
4%% less cost price
=(100-4) or 96% of x=24x/25 TK
Second SP=(24x/25+24x/25 of 12.5%)
=216x/200 TK
According to the question,
(216x/200)-(53x/50)=4
Or, X=200
The cost price of the article=200 TK
Answer:200 TK

02:A man's running speed is 3 times of his walking speed.He runs a distance and come back by walking total time taken 2 hrs.what was the distance if he runs 9 miles per hour.
[MODHUMOTI BANK PO-2017][PBL -2008]

Solution:
Let,
Distance be=D miles
Runs speed=9 m/h
Walking speed=9/3=3 m/h

According to the question,
D/3 +D/9=2
Or, D=4.5 miles
Answer:4.5 miles

03:A,B,C started a job which they can complete in 2 days.B can do the job in 5 days and C can do it in 4 days.After working for 1 day,both B & C left. A complete testbed of the work how many days?
Solution:
Let,
Total portion work be 1 portion
(A+B+C) 1 day do the job =1/2 portion
B & C 1 day do the job
=(1/5+1/4) portion

=9/20 portion
So,
A 1 day done the job
=(1/2-9/20) portion
=1/20 portion
Remaining work=(1-1/2)=1/2 portion
A 1/20 portion job done=1 day
A 1/2 portion job done=(20/2)
=10 days
Answer:10 days

22:Solve the equation:
1/(2x-5) + 1/(2x-11) = 1/(2x-7) + 1/(2x-9)
Answer:4

➢ Meghan Bank -MTO-2017

1:While out on picnic,a group of boys came upon an apple tree.One of the boys climbed up tree and picked enough apples for each boy to have three,with none left over,the along with came three boys,making it impossible to divide the picked apples evenly. However, after picking one more apple and adding it to the total, every boy had two apples with none left over.How many apples were finally divided ?
[Meghan Bank -MTO-2017]
Solution:
Let,
The total boys were in the picnic=X
and
Picked up total apples from tree=Y
Form first condition,
Y/X =3 ---------(1)
Second condition,
(Y+1)/(X+3)=2 ----------(2)

From equation no (1)=»
Y=3X-------(3)
Putting the value Y=3X in equation (2)
we get X=5
From equation(3)=»
Y=15
Hence,The total apples picked up from the tree 15
But (15+1)=16 apples were distributed among the boys then every boys got Two apple
Answer:16

2:Mr. Zakir gave 40 % of the money he had, to his wife.He also gave 20% of the remaining amount to each of his three sons.Half of the amount now left was spent on miscellaneous items and the remaining amount of tk 12000 was deposited in the bank .How much did Mr. Zakir Have initially ?[Meghan Bank -MTO-2017]
Solution:
Let,
Mr Zakir's total initially amount was= tk x
He gave his wife
= 40% of x
=2x/5 tk
Mr Zakir's remaining amount
={x-(2x/5)}
=3x/5 tk
Each son got=20%of 3x/5
=3x/25
So three son got
={3*3x/25}
=9x/25
Remaining amount is
(3x/5-9x/25)
=6x/25
According to the question,
(6x/25)*1/2=12000
Or, X=100,000

Answer:100,000 Tk

Bank ASIA MTO -2017

01.Mr. X borrowed Tk. 500 at 5% simple interest per year. After some time, he borrowed Tk. 400 at 3.5% simple interest per year for the second time. Six months after the second time borrowing, he repaid both the borrowed money along with interest and the amount repaid was Tk. 994.50. How many years after the first time borrowing Mr. X repaid the borrowed money?[Bank ASIA MTO -2017] [KSB SO-2013] [23th BCS WRITTEN]
Solution:
Total amount=(400+500)=900 Tk
Total interest=(994.5-900)=94.5 Tk

3.5% interest rate
400 Tk 1/2 years interest
=[(7*400)/(2*100*2)]
= 7 Tk.

Remaining interest=(94.5-7)=87.5 Tk
5% rate of interest

500 Tk 1 years interest
=(5*500/100)=25 Tk

25 Tk interest for 1 years
87.5 Tk interest(87.5/25)=3.5 years

So after 3.5 years then he took second amount
Answer:3.5 years

2..Rahim can do a piece of work in 80 days.Rahim works for 10 days and Karim alone finishes the rest of the work in 42 days.How much time would it take for the two of them together to complete the whole work?
[Bank ASIA MTO -2017]
Solution:
Let,
.
Total portion work=1
Rahim 80 days done=1 portion
Rahim 10 days done=(10/80)=1/8 portion
Remaining work=(1-1/8)
=7/8 portion
Karim 7/8 portion done=42 days
Karim 1 or full portion work done
=(42*8/7)=48 days
Both Rahim & Karim 1 day done
=(1/80+1/48) portion
=1/30 portion
Both
1/30 portion done=1 days
Full work done=(1*30)/1=30 days
Answer:30 days

40. Solve the equation
(x-4)/(x-1) + (x-7)/(x-3) + (x-2)/(x-9)=3
Solution:
{(x-4/x-1)-1}+{(x-7/x-3)-1}+{(x-2/x-9)-1}=0
Or, { -3/x-1}-{4/x-3}+{7/x-9} =0
Or, {7/(x-9)}={3(x-3)+4(x-1))/(x-1)(x-3)}
Or, $7(x^2 -4x+3)=(x-9)(7x-13)$
Or, $7x^2 -28x+21= 7x^2 -76x+117$
Or, 48x=96
Or, x=2
Answer:2

3.The length of a rectangle field is 1.5 times of width.An amount of Tk 10,260 was needed to cover the field with grass at the rate of 1.9 Tk per square meter.How much would it cost to fence the four sides of the rectangular field at the rate of Tk 2.5 per meter?
[Bank ASIA MTO -2017]
[One Bank (SCO)-2017]
[Lankabangla Finance -MTO-2017]
Solution:
Area of the rectangle
=(10260/1.9)
=5400 square meter
Let,
Width of the rectangle=x meter

Length of rectangle=(3x/2) meter
We know,
(3x/2)*x=5400
Or, x=60
And
Length=(3*60/2)=90 meter
Perimeter of rectangle
=2[90+60]
=300 meter
So total Tk needed around rectangle fence=(300*2.5)=750 Tk
Answer:750 Tk

➢ Lankabangla Finance-MTO-2017

1.A, B, C can complete a piece of work in 16, 32, 48 days respectively.They started working together but C left after working 4 days and B left 2 days before the completion of the work.How many days require to complete the work?
[Social Islamic Bank-PO-207]
[LankaBangla Finance Ltd.MTO-2017]
Solution-1:
Let,
Total time taken to complete the whole work is x days
According to the question,
x/16+(x-2)/32+(4/48)=1
Or,6x+3x-6+8=96
Or,9x=94/9
Answer:94/9 or 10.44 days

Alternative Solution-2:
Suppose,
Total work be 96 units
[LCM of 26,32 & 48 is 96]
Efficiency of work rate per day of A,B & C is

A= 96/16=6 units
B= 96/32=3 units
C=96/48=2 units
Worked done by A,B,C in 4 days
= {(6+3+3)*4}=44 units
Worked done by A in 2 days
= 2*6= 12 units
Remaining work
= 96-(44+12)
=40 units
A & B 1 day done=(6+3)=9 units
Remaining worked done by A & B
= 40/9
Total days required to finish the whole work={4+2+(40/9)}=10(4/9) days

Answer:10.44 days

2.The length of a rectangle field is 1.5 times of width.An amount of Tk 10,260 was needed to cover the field with grass at the rate of 1.9 Tk per square meter.How much would it cost to fence the four sides of the rectangular field at the rate of Tk 2.5 per meter?
[Bank ASIA MTO -2017]
[One Bank (SCO)-2017]
[Lankabangla Finance -MTO-2017]
Solution:
Area of the rectangle
=(10260/1.9)
=5400 square meter
Let,
Width of the rectangle=x meter

Length of rectangle=(3x/2) meter
We know,
(3x/2)*x=5400
Or, x=60
And
Length=(3*60/2)=90 meter
Perimeter of rectangle
=2[90+60]
=300 meter
So total Tk needed around rectangle fence=(300*2.5)=750 Tk
Answer:750 Tk

3.A man to go 10 km to catch a bus .He walks part of the way at 7 km/hr and runs the rest of the way at 12 km/hr.If he takes 1 hr 15 minutes to complete his journey,Find how far he walked.
[Dhaka BANK-MTO-2004][LankaBangla Finance Ltd.MTO-2017]
Solution:

Let,
He walked x km
and
He runs(10-X) km
Total time taken=1 hr 15=5/4 hrs
According to the question,
X/7 + (10-X)/12=5/4
Or, x=7
So, He walks 7 km
Answer:7 km

4.Solved the equation
1/(x+2) + 1/(x+5)=1/(x+4) + 1/(x+3)
[Social Islamic Bank-PO-207]
[LankaBangla Finance Ltd.MTO-2017]
Solution:
1/(x+2)-1/(x+4)=1/(x+3)-1/(x+5)
or, (x+4-x-2)/(x+2)(x+4)=(x+5-x-3)/ (x+3)(x+5)
or, 2/(x+2)((x+4)=2/(x+3)(x+5)
or, 1/ (x+2)(x+4) =1/(x+3)(x+5)
or, (x+2)(x+4)=(x+3)(x+5)
or, x^2+4x+2x+8=x^2 +3x+5x+15
or, 6x+8=8x+15
or, 2x= -7
or, x= -7/2
Answer: -(7/2)

➢ Social Islamic Bank-PO-2017

1.A, B, C can complete a piece of work in 16, 32, 48 days respectively.They started working together but C left after working 4 days and B left 2 days before the completion of the work.How many days require to complete the work?
[Social Islamic Bank-PO-207][LankaBangla Finance Ltd.MTO-2017]
Solution-1:
Let,
Total time taken to complete the whole work is x days
According to the question,
x/16+(x-2)/32+(4/48)=1
Or,6x+3x-6+8=96
Or,9x=94/9
Answer:94/9 or 10.44 days

Alternative Solution-2:
Suppose,
Total work be 96 units
[LCM of 26,32 & 48 is 96]

Efficiency of work rate per day of A,B & C is
A= 96/16=6 units
B= 96/32=3 units
C=96/48=2 units
Worked done by A,B,C in 4 days
= {(6+3+3)*4}=44 units
Worked done by A in 2 days
= 2*6= 12 units
Remaining work
= 96-(44+12)
=40 units
A & B 1 day done=(6+3)=9 units
Remaining worked done by A & B
= 40/9
Total days required to finish the whole work={4+2+(40/9)}=10(4/9) days

Answer:10.44 days

2.The total cost price of two watches is Tk. 840. One is sold at a profit of 16% and the other at a loss of 12%. There is no loss or gain in the whole transaction. The cost price of the watch on which the shopkeeper gains, is-
[Social Islamic Bank-PO-2017]

Solution:
Let,
Cost price of first watch is Tk x
So,
Cost price of Second watch
=Tk (840-x)
16% profits Selling price of first watch={(116*x)/100} Tk
12% loss SP of second watch
={88*(840-x)/100} Tk
According to the question,
(116x/100)+{(88*840-88x)/100}=840
or, (116x+ 73920-88x)/100=840
or, 28x+73920= 84000
or, 28x = 84000-73920
or, x= 100840/28
or, x= 360
Now, Cost price of first watch
= 360 Tk
C.p. of second = (840-x) = (840-360)= 480Tk.(answer
Solution-2:
Let,
Cost price of first watch is tk.x
And cost price of second watch is tk(840-x)

According to the question,
16% of x = 12% of (840-x)
Or, 16x = 12*(840-x)
Or, 16x = 10080 -12x
Or, 28x = 10080
Or, x = 360
And cost price of other watch is
=(840-360)
=480 Tk
So , cost price of two watches are 360 & 480
Answer: 360 Tk ; 480 Tk

3.Solved the equation
1/(x+2) + 1/(x+5)=1/(x+4) + 1/(x+3)
[Social Islamic Bank-PO-207]
[LankaBangla Finance Ltd.MTO-2017]
Solution:
1/(x+2)-1/(x+4)=1/(x+3)-1/(x+5)
or, (x+4-x-2)/(x+2)(x+4)=(x+5-x-3)/ (x+3)(x+5)
or, 2/(x+2)((x+4)=2/(x+3)(x+5)
or, 1/ (x+2)(x+4) =1/(x+3)(x+5)
or, (x+2)(x+4)=(x+3)(x+5)
or, x^2+4x+2x+8= x^2+3x+5x+15
or, 6x+8=8x+15
or, 2x= -7
or, x= -7/2
Answer: -(7/2)

4.The perimeter of a square field is equal to the perimeter of a rectangle field.Length of the rectangle fields is 3 times of its width and the area is 768 square meter.How many square sized tiles of 80 centimetre wide will be required to cover the square field?
[Social Islamic Bank-PO-2017]
Solution:
Let,
The width of the rectangle be x meter
So,
The length of the rectangle be 3x meter
According to the question,
3x*x=768
0r, x =16
So,
The perimeter of the rectangle,
=2(3*16+16)
=128
So, the perimeter of the square is 128 meters
Suppose,

Each Side of square is a
From question,
4a=128
Or, a =32
Area of the square is
$=(a)^2$
$=(32)^2$
=1024 square meter
=10240000 square cm
Area of the tiles
=(80*80) square cm
=6400 square cm
Number of tiles
=10240000/6400
=1600 piece
Answer:1600

ONE Bank SCO-2017

1.Salam used a part of Tk.100000 to purchase a television. Of the remaining portion, he invested 1/3 of it at 4% simple annual interest and 2/3 of it at 6% simple annual interest. If, after a year, the income from two investments totaled tk.
320, what was the purchase price of the television?
[ONE Bank SCO-2017]

Solution-1:
Let,
The purchase price of the TV =xTk
and
Remaining amount of money= (100,000 – x) Tk
First portion interest
=(100,000-x)*1/3 *4%
=(100000-x)/75
Second portion interest
=(100,000– x)*2/3 * 6%
=(100000-X)/25

According to the question
(100000-x)/75 +(100000-X)/25=320
Or,[(100000-X)(1/75+1/25)]=320
Or,[(100000-X)*4/75]=320
Or,400000-4x=320*75

Or, x = 94,000
Answer :94,000 Tk

Solution-2:
Let,
The purchase price of the TV=Tk x
Given that,
Total amount=100000 Tk
Remaining amount of money
=Tk(100,000 – x)
According to the question
{(100,000 – x)*1/3 *4%}+{(100,000 –x)*2/3 * 6%} = 320
Or,(1000/3*4+12000/3)–(4x/300) (12x/300)= 320
Or,4000/3+(12000/3)–(4x/300)– 12x/300 = 320
Or, 400000+1200000 -4x–12x= 320*300
Or,16x =1600000–96000
Or, 16x = 1504000
Or, x = 94,000
Answer:94,000 Tk

2.The length of a rectangle field is 1.5 times of width.An amount of Tk 10,260 was needed to cover the field with grass at the rate of 1.9 Tk per square meter.How much would it cost to fence the four sides of the rectangular field at the rate of Tk 2.5 per meter?
[Bank ASIA MTO -2017]
[One Bank (SCO)-2017]
[Lankabangla Finance -MTO-2017]
Solution:
Area of the rectangle
=(10260/1.9)
=5400 square meter
Let,
Width of the rectangle=x meter

Length of rectangle=(3x/2) meter
We know,
(3x/2)*x=5400
Or, x=60
And
Length=(3*60/2)=90 meter
Perimeter of rectangle
=2[90+60]
=300 meter
So total Tk needed around rectangle fence=(300*2.5)=750 Tk
Answer:750 Tk

3. Solve the equation : 4/(2x+3)+15/(5x+4)=35/(7x+6)[One Bank(SCO)-2017]
Solution :
4/(2x+3) + 15/(5x+4)=35/(7x+6)
Or,4(2x+3)+15/(5x+4)=21/(7x+6)+14/(7x+6)
Or,4/(2x+3)- 14/(7x+6)=
21/(7x+6)-15/(5x+4)
Or,(28x+24-28x-42)/(2x+3)= (105x+84-105x-90)/(5x+4)
Or,-18/(2x+3) = -6/(5x+4)
Or, 3/(2x+3)= 1/(5x+4)
Or, 15x +12= 2x+3
Or, 13x =-9
Or, x =-9/13
Answer:-(9/13)

City Bank MTO -2017

1. The ratio between the length and the breadth of a rectangular park is 3:2. If a man cycling along the boundary of the park at the speed of 12 km/hr completes one round in 8 minutes, then what is the area of the park (in sq. m)?[City Bank MTO -2017][Al Arafah Islamic Bank-2013}

Solution:
Let,
Length=3x
Breadth=2x
From the question,
60 minutes the man covere=12km=12000 m
So,
In 8 minutes the man covere=[(12000*8)/60]
=1600 meters
Perimeter of the rectangle is
2(3x+2x) = 1600
x= 160
The Area of the rectangle
=(3x*2x)
= (3*160)(2*160)
=153600 square meter
Ans: 153600 sq.m

2.During the next tree plantation week, Mr. X is considering planting trees in one of its own rectangular piece of land which is 90 feet long 66 feet wide. This is suspended by boundary wall of 5 feet height. It has been decided that trees will be planted leaving 5 feet and free from the wall in all four sides. It was been decide that the distance from one tree to another in both row and column will be 4 feet. What is the maximum numbers of trees that can be planted in the land?[City Bank MTO -2017]
Solution:
Given that,

The length of the field=90 feet
Possible length of the rectangle
= 90-(5*2)= 80 feet
Possible Width of the rectangle
= 66-(5*2)
= 56 feet
Possible trees in row
= (56/4)+ 1
= 15
And
Possible trees in Column
= (80/4) + 1
=21
Maximum tree
= 21*15
= 315

Ans: 315

➢ National Bank-PO-2017

1:A, B, C can complete a work in 16, 32, 48 days respectively.After starting work 4 days later C left and B left 2 days before the completion of the work.How many days require to complete the work? [National_Bank_PO_2017]

Solution:
Let,
Total time taken is x days
According to the question,
x/16+(x-2)/32+4/48=1
Or,6x+3x-6+8=96
Or,9x=94/9
Answer:94/9 or 10.44 days

Alternative Solution:
LCM of 26,32&48 is 96
Let,
Total work=96
efficiency of
A= 96/16=6 units
B= 96/32=3 units
C=96/48=2 units
worked done by A,B,C in 4 days = (6+3+3)*4=44 units
worked done by A in 2 days = 2*6= 12 units
Remaining work
= 96-(44+12)

=40 units
remaining worked done by A&B
= 40/9
Total days = (4+2+40/9)=10(4/9) days
Answer:10.44 days

2:The perimeter of a square is equal to the perimeter of a rectangle field. The length of the rectangle is three times of its width and the area is 768 sq.meter. How many square sized tiles of 80 cm width will be required to cover the square field ?[National_Bank_PO_2017]

Solution:
Let,
The width of the rectangle is x m
And the length of the rectangle is 3x meter
According to the question,
x*3x=768
Or, x=16
So,
The width of rectangle is 16 meter
And length of rectangle is (3*16)=48 meter
Perimeter of the rectangle
=2(16+48)
=128 m
Suppose,
Each side of the square is a meter
Since the perimeter of the square is equal to the perimeter of the rectangle
4a=128
Or, a=32
Area of the square
=32*32
=1024 square meter
=10240000 square cm
Each tiles wide is 80 cm
Area of the tiles
=(80*80) square cm
Required tiles need
=(10240000/6400)
=1600
Ans:1600

3:Aman,Belal and Chad started a small business with a total amount tk 28,000.Aman paid tk 4500 more than Belal and Belal paid tk 7000 less than Chad.If the company made a profit of tk 5600 .How much profit should Belal receive?[National_Bank_PO_2017]

Solution:
Let,

Belal paid be x tk
Aman paid be (x+4500) tk
Chad paid be (x+7000) tk
According to the question,
x+x+4500+x+7000=28000
Or, x=5500
Belal paid=5500 tk
Aman paid=10,000 tk
Chad paid =12500 tk
Ratio of investment is
Aman:Belal:Chad
=10,000:5500:12500
=20:11:25
Sum of ratio=56
Total profit =5600 tk
Belal should receive profit
=5600*(11/56)
=1100 tk
Ans:1100 tk

4:8/(2x-1) + 9/(3x-1)=7/(x+1) [National_Bank_PO_2017]

Solution:
8/(2x-1)+9/(3x-1)=7/(x+1)
Or,8/(2x-1)+9/(3x-1)=3/(x+1)+4/(x+1)
Or,8/(2x-1)-4/(x+1)=3/(x+1)-9/(3x-1)
Or,{8(x+1)-4(2x-1)}/(2x-1)(x+1)={3(3x-1)-9(x+1)}/(x+1)(3x-1)
Or,1/(2x-1)=-1/(3x-1)
Or, 3x-1=-2x+1
Or, 5x=2
Or x=2/5 Ans: 2/5

BANGLADESH BANK OFFICER 2015

1.A shop stocks four types of caps, there are 1/3 as many red caps as blue caps and 1/2 as many green caps as red caps. There are equal number of green caps and yellow caps.If there are 42 blue caps,then what percent of the total caps in the shop are blue?

[BANGLADESH BANK OFFICER 2015]
Solution:
Given that,
Blue caps=42
Red caps= 42/3=14
Green caps =14/2=7
Yellow caps=7
Total caps =42+14+7 +7=70

Percentage of blue caps
={(42/70)100}= 60%
Answer:60%

2.The annual incomes and expenditures of a man and his wife are in the ratios 5:3 and 3:1, respectively. If they decide to save equally and find a balance of Tk. 4000 at the end of the year, what was their income? [BANGLADESH BANK OFFICER 2015]
Solution:
Let, their income be 5x and 3x and their expenditure be 3x and x.
According to the question,
(5x + 3x)-(3x + x)=4000
Or, 4x = 4000
Or, x = 1000
So, Man's income 5x = 5*1000 =Tk. 5000
Woman's income 3x = 3*1000 =Tk. 3000
Answer:5000 & 3000 TK

3.A person sold two articles each for the same price of Tk. 1040. He incurs 20% loss on the first and 10% loss on the second. Find his overall percentage of loss.
[BANGLADESH BANK OFFICER 2015]
Solution:
Suppose,
Price be Tk.100
At, 20% loss, selling price
=100–20 =Tk.80
And at 10% loss selling price
= 100-10=Tk. 90
So, cost price of First item
= (1040/80)100 =Tk.1300
And cost price of second item
= (1040/90)100=Tk.1155.55
Total cost of two items
=Tk.(1300 + 1155.55)
=Tk. 2455.55
But selling price
=1040 + 1040 =Tk. 2080.
So, loss =Tk. (2455.55 -2080) =Tk. 375.55
So, overall loss percentage
=(375.55/2455.55)100=15.29%
Answer:15.29%

4.If the sum of five consecutive integers is S, what is the largest of those integers in terms of S?[BANGLADESH BANK OFFICER 2015]
Solution:
Let,
Consecutive integers are x, x+1, x+2, x+3, x+4.

According to the question,
x+x+1+x+2+x+3+x+4=s
Or, 5x+10=s
Or, x=(s - 10)/5
Or, x + 4 =(s-10)/5 + 4
[Add 4 both side]
Or, x + 4 = (S+ 10)/5.
Or, x + 4 = S/5 + 2
So, the largest integer=(S/5)+ 2
Answer:(S/5)+2

5.The difference between two numbers is five and the difference of their squares is 65.What is the larger number? [BANGLADESH BANK OFFICER 2015]
Solution:
Let,
Larger number be x and smaller number be y
According to the question,
x - y = 5.....(i)
x2– y2 = 65 .....(ii)
Or,(x + y) (x - y) = 65
Or, (x + y)*5= 65
Or, x + y = 13.....(iii)

From, (i)+(ii) we get,
2x = 18
Or, x = 9
Putting the value of x in (i) we get,
9 - y = 5
Or, y = 4
So, larger number = 9
Answer:9

6.Robi drove 100 miles to visit a friend. If he had driven 8 miles per hour faster than he did, he would have arrived in 5/6 of the time, he actually took. How many minutes did the trip take? [BANGLADESH BANK OFFICER 2015]
Solution:
Let, Robi took x hours to cover 100 miles
Actual speed=100/x mph
[mph= Mile per hour]
New speed =(100/x + 8) mph
New time taken=x*(5/6)=5x/6 hours.
We know,
Speed × Time =Distance
(100/x + 8)*(5x/6) = 100
Or, x =5/2 hrs={5*60/2}=150 mins.
Answer:150 mins

7.Of the three numbers, second is twice the first and is also thrice the third. If the average of the three numbers is 44, then what will be the largest number?
[BANGLADESH BANK OFFICER 2015]
Solution:
Suppose,
1st Number=x,
2nd Number=2x
and 3rd Number=2x/3
According to the question,
x+2x+2x/3=44*3
Or,(3x+6x+2x)/3=132
Or, 11x =396
Or, x=36.
So, the largest number is
= 2*36 = 72
Answer:72

Standard Bank TAO-2016

1.A trader while selling an item,was asking for such a price that would enable him to offer a 20% discount and Still make a profit of 30% on cost price. If cost price is 50 tk, what was his asking price?[SBL TAO-2016]
Solution:
Let ,
Cost price =100 Tk
20%discount selling price
=(100-20)=80 Tk
Given,
cost tk =50
30% profit on cost=(50+50*.30)
sp=tk. 65

when sp tk 80 asking price 100
when sp tk 65 " [(100*65)/80]
=tk. 81.25
Answer:81.25 Tk

2. A sales person receives daily wage of Tk 250 fixed and also gets 15% commission on all sales he makes.How much take worth of sales does he need to make in order to bring his total daily income of Tk 1000 ?[SBL TAO-2016]
Solution:
Sale's person got commission
=(1000-250) Tk
=Tk. 750
Let,

Total sales=x Tk
So,

X of 15%=750
Or, x=[(750*100)/15]
Or, x=5000 Tk
Answer:5000 Tk

3.The length of a rectangular field is 30 feet more than its breadth. If the perimeter of rectangular field is 380 feet. What is the area of the field in square feet? [SBL TAO-2016]
Solution:
Let,
Breath = x & length = (x+30)
we know that,
perimeter of Rectangular
= 2(length + breath)
Or, 380 = 2(x+x+30)
Or, x = 80
Now,
Breath = 80 and
length = x+30 or 80+30, = 110
So,Area = (length*breath)
= (110*80)
= 8800 square feet

Answer:8800 square feet

4.There are two tapes in a water tank.The first tap pumps water in the tank and the second one drains it out.The first tapes 30 minutes to make the full and the second tapes needs 40 minutes to drain that water out.If both taps are opened at the same time,how Long will it take to make a half full tank?
[SBL TAO-2016]
Solution:
First pipe 1 minute can filled
=1/30 part
2nd pipe 1 minute can out
= 1/40 part
They together 1 minute can filled
=(1/30-1/40) part
=1/120 part

Now, 1/120 part filled in 1 minute
Then, 1/2 part """" """" =(120*1)/2
=60 minutes
Answer:60 minutes

Standard Bank(TAO)Cash-2016

01.A garden is 60 meter long and 20 meter wide. Inside the garden there is a 5 meter wide path around it. What is the area of the path in square meter?[Standard Bank(TAO)Cash 16]

Solution:

Area of the garden with path= (60×20) sq. m.

= 1200 sq. m.

Area of the garden without path= (60-5-5)×(20-5-5) sq. m.

= 50×10 sq. m.

= 500 sq. m.

Area of the path= (1200-500) sq. m.

= 700 sq. m.

Answer: 700 sq. m.

02. The simple interest rate of a bank was reduced to 5% from 7%. As a consequence Karim's income from bank interest was reduced by Tk. 2100 in 5 years. How much is Karim's initial deposit with the bank? [Standard Bank(TAO)Cash 16]

Solution:

The rate of interest rate reduced= 7% - 5% = 2%

In 5 years interest reduced=2100 Tk

In 1 year interest reduced = 2100/5=420 Tk

Tk.2 reduce when deposit Tk. 100

Tk. 1 " " " 100/2

Tk.420 " " " (100×420)/2

=21,000 Tk

Answer: 21,000 Tk

03. A can dig a pond in 30 days and B can dig the same pond in 20 days. In how many days A and B can dig the pond if they work together? [Standard Bank(TAO)Cash 16]

Solution:

In 30 days A can dig 1 part of the pond

::::::::::1::::::::::A:::::::::: 1/30 ::::::::::::

In 20 days B can dig 1 part of the pond

::::::::::1::::::::::B :::::::::::::: 1/20 ::::::::::::::::

In 1 day (A+B) can dig=1/30 + 1/20=1/12 Portion

Hence,total time taken 12 days answer: 12 days

04. Rahim and Karim have equal amount of money. Runa has half of money that Rahim has. And Mina has half of money that Runa has. If you add taka 1, the sum of their money will be 100 taka. How much money Rahim has?

[Premier Bank TJO-General-2018]

[Bangladesh Bank AD-2004]

[Standard Bank TAO-Cash-2016]

Solution:

Let, Karim and Rahim have = x tk

So, Runa has = x/2 tk

and Mina has = x/4 tk

According to the queston,

$x + x + x/2 + x/4 + 1 = 100$

Or, $x + x/2 + x/4 + 1 = 100$

Or, $(8x + x + x + 4)/4 = 100$

Or, $11x + 4 = 400$

Or, $x = 36$

Answer:36

National Bank PO-2015

01.A sum of money is to be distributed equally among a group of children. If there were 25 children less than each would get TK. 1.50 more, and if there 50 children more, each would get TK. 1.50 less. Find the number of children and the amount of money distributed.

[National Bank PO-2015]

Solution:

Let, total number of children be ‘x’ and money distributed to child ‘y’

So, total amount of money =xy

According to the question,

$xy =(x-25)(y+1.50)$

Or, $xy= xy-25y-37.5+1.5x$

Or,$25y+37.5=1.5x$……..(i)

Again,

$xy=(x+50)(y-1.50)$

Or, $xy= xy-75+50y-1.5x$

Or,1.5x=50y-75…….(ii)
From equation (i) and (ii)
50y-75=25y+37.5
Or,y =4.5
From equation (2)=>>
1.5x= 50×4.5-75
Or,x=100
So, the number of children=100
and the amount of money = Tk. (4.5×100)= Tk. 450
Answer: children100 and Tk. 450.

02 A video magazine distributor made 3500 copies of the May issue of the magazine at a cost of Tk. 4,00,000. He gave 500 cassettes free to some key video libraries. He also allowed a 25% discount on the market price of the cassette. In this manner, he was able to sell all the 3500 cassettes that were produced. If the market price of a cassettes was Tk. 160, what is his gain or loss for the May issue of the video magazine? [National Bank PO-2015]
Solution:
As the distributor gives 500 copy free,
The remaining number of copy=3500-500=3000
Market price of each cassette was Tk. 160.
So, at 25% discount selling price =160 -160×25% =Tk. 120.
Now selling price of 3000 cassettes=120×3000 =Tk. 360,000
Cost of 3500 cassettes=Tk. 400000
So, loss =4,00,000- 3,60,000 =Tk. 40,000.
Ans: Tk. 40,000.

3.Find The value of $x^4 + \frac{1}{x^4}, of = x = \sqrt{5} - \sqrt{4}$[National Bank PO-2015]

Solution,

Give the, $x = \sqrt{5} - \sqrt{4}$ ———————— (I)

Now, Revering Equation ———————— (I)

$$\frac{1}{x} = \frac{1}{\sqrt{5} - \sqrt{4}}$$

Or $\frac{1}{x} = \frac{(\sqrt{5}+\sqrt{4})}{(\sqrt{5}-\sqrt{4})(\sqrt{5}+\sqrt{4})}$

Or, $\frac{1}{x} = \frac{(\sqrt{5}+\sqrt{4})}{(\sqrt{5})^2-(\sqrt{4})^2}$

Or, $\frac{1}{x} = \frac{\sqrt{5}-\sqrt{4}}{5-4}$

Or, $\frac{1}{x} = \sqrt{5} + \sqrt{4}$ ———————— (II)

$\{(\mathrm{I}) + (\mathrm{II})\}\ Wehave$

$x + \frac{1}{x} = (\sqrt{5} - \sqrt{4}) + (\sqrt{5} + \sqrt{4})$

Or, $x + \frac{1}{x} = \sqrt{5} - \sqrt{4} + \sqrt{5} + \sqrt{4}$

$\therefore x + \frac{1}{x} = 2\sqrt{5}$ ———————— (III)

Now,

$$x^4 + \frac{1}{x^4} = (x^2)^2 + \left(\frac{1}{x^2}\right)^2$$

$$= \left(x^2 + \frac{1}{x^2}\right)^2 - 2x^2\frac{1}{x^2}$$

$$= \left(x^2 + \frac{1}{x^2}\right)^2 - 2$$

$$= \left\{(x)^2 + \left(\frac{1}{x}\right)^2\right\}^2 - 2$$

$$= \left\{\left(x + \frac{1}{x}\right)^2 - 2x\frac{1}{x}\right\}^2 - 2$$

$$= \left\{\left(x + \frac{1}{x}\right)^2 - 2\right\}^2 - 2$$

$= (18)^2 - 2$

$= 324 - 2$

$= 322$

Ans: 322

Midland bank ATO-2015

1. A basket ball team has won 15 games and lost 9.If these games represent 16.67% of the games to the played, then how many more games must the team win to average 75% for the season? [Midland bank ATO-2015]

Solution:

Total game that have already been played=15+9=24.

According to the question,

16.67% =24

Or,100%=(24×100)/16.67 =144.

To win 75% of the game the team need to win=144×75%=108.

So it needs to win (108-15)=93 more games.

Answer: 93 games.

2.A person earns yearly interest of Tk. 920 by investing Tk. X at 4% and Tk. Y at 5% simple interest rate. If he had invested Tk. X at 5% and Tk. Y at 4% simple interest rate, then his yearly interstearning would have been reduced by Tk. 40. Find out the amount of X and Y[Midland bank ATO-2015]

Solution:

According to the question,

X×4%+Y×5% =920

4x+5y = 92000 .....(i)

And, X×5% + Y×4%=880

5x+4y=88000.....(ii)

Now, (i)×5-4×(ii)

We get, 9Y=108,000

Y = 12000.

Putting the value of y=12000 in equation (1)

4x+5*12000 = 92000

Or, x=8000

Ans: X=8000 tk and Y= 12,000 tk

3. In a country, 60% of the male citizen and 70% of the female citizen are eligible to vote. 70% of the male & 60% of female citizen is eligible to cast their vote. What fraction of citizens voted during their election? [Midland bank MTO-2015]

Solution:

Suppose,

Male citizens be 100

and

Female citizens be 100

So, total citizens = 100+100

= 200

Now,

Eligible Male voters

= (100*60)/100

= 60

Eligible Female voters

={(100*70)/100}

=70

Casted male votes

={(60*70)/100}

=42

Casted Female votes

={(70*60)/100}

=42

Required Fraction

= (42+42)/(100+100)

=84/200

=21/50

Answer:21/50

Midland bank MTO-2015

1. A father has divided his property between his two sons A and B. A invests the amount at a compound profit of 8%. B invests the amount of 10% simple profit. At the end of 2 years, the profit received by B is 1336 taka more than A. Find the amount of both. Total amount of his father is Tk. 25000. [Midland bank MTO-2015]

Solution:

Let, share of A=x Tk

Share of B=(25000-x) Tk

A's profit=$x*(1+8\%)^2-x$

$=x*(1+8/100)^2-x$

$=0.1664x$

B's profit= $(25000-x)*2\times10\%$

$=(25000-x)*0.2$

$=5000-0.2x$

According to the question,

$5000-0.2x-0.1664x=1336$

Or, $5000-1336=0.2x+0.1664x$

Or, $0.3664x=3664$

Or,$x=10000$

So, Share of A=10,000 Tk and share of B=25,000-10,000=15,000 Tk

Ans: 10,000 Tk and 15,000 Tk

Bangladesh Samabay Bank Officer-2015

1.Three partners shared the profit in a business in the ratio 5 : 7 : 8.They had partnered for 14 months, 8 months and 7 monthsrespectively. What was the ratio of their investments? [BSB Officer-2015][Jamuna Bank PO-2012]

Solution:

Let,their initial investment be

x,y,z

Total investment=14x:8y:7z

Profit=5:7:8

So,
14x/8y=5/7
y=49x/20
And,
14x/7z=5/8
Or, z=16x/5
Investment ratio
=x:49x/20:16x/5
=20:49:64
Answer:20:49:64

2. Mr. Rahman gave 40% of the money he had to his wife. He also gave 20% of the remaining amount to each of his three sons. Half of the amount now left was spent on miscellaneous items and the remaining amount of taka 12000 was deposited in the bank. How much money did Mr. Rahman have initially? [BSB Officer-2015][
Solution:
Let, the initial amount be x Tk.
After 40% giving wife,
Remaining amount = x- 40% of x Tk.
= x-0.40x Tk
= 0.60x Tk
After giving three sons, each 20% of 0.60x Tk.
Remaining amount
= 0.60x – 3(20% of 0.60x) Tk.
= 0.60x - 3×0.12x Tk.
= 0.24x Tk.
Hence,Spent on miscellaneous item
=1/2of 0.24x Tk. = 0.12x
According to the question,
0.12x = 12000
Or, x= 12000/0.12
Or,x=100,000
Hence, Initial amount= Tk. 100,000.
Answer: Tk. 100,000.

❖NRBC (MTO)-2016

01.A certain sum of money is Tk.900 (including principal) in 5 years and Tk.1200 (including principal) in 8 years. What's the rate of simple interest? [NRBC (MTO)-2016]

Solution:

In 8 years, Principal amount + Interest= 1200 Tk.

In 5 years, Principal amount + Interest= 900 Tk.

……

In 3 years interest= 300 Tk.

In 1 year interest=Tk. 300/3= Tk. 100

In 8 years interest = Tk. (100×8) = Tk. 800

So, Principal amount= Tk. (1200-800) = Tk. 400

In 1 year,

Tk. 400 gives interest Tk. 100

Tk. 1 …….. [100/400]

Tk. 100 …… …={(100*100)/400}= Tk. 25

Hence,Interest rate be 25%.

Ans: 25%

2. A is 10 miles west to B, B is 30 miles north to C, C is 20 miles east to D. What's the distance from A to D? [NRBC (MTO)-2016]

Solution:

According to the Pythagoras theorem,

$AD^2= DE^2+AE^2$

Or, $AD^2=10^2+30^2$

Or, $AD^2= 1000$

Or, AD= √1000

Hence,AD= 10√10 Ans. 10√10

Mutual Trust Bank MTO-2016

1.Suppose you deposited Tk 10000 on January 1. 2012 at 12.50% interest rate for 1 year. On July 1 2013 Tk15000 at 12% interest rate for 6 months and on October 1 2013 Tk 20000 at 11.5% interest rate for 3 months(assume that the stated interest rates are simple and annual). Suppose you withdrew all deposits including due interests on December 31. 2013. Calculate the overall annual rate of interest you have received.[MTB MTO-2014][SBL MTO-2016]

Solution:
#Investment_01:
•• Tk. 10000 from 01.01.2016 to 31.12.2016 @12.50%.
Total Interest Earned = Tk. 10000 × 12.50% × 12/12 = Tk. 1250.
Weighted average annual investment = Tk. 10000 × 12/12 = Tk. 10000.

#Investment_02:
•• Tk. 15000 from 01.07.2016 to 31.12.2016 @12%.
Total Interest Earned = Tk. 15000 × 12% × 6/12 = Tk. 900.
Weighted average annual investment = Tk. 15000 × 6/12 = Tk. 7500.

#Investment_03:
•• Tk. 20000 from 01.10.2016 to 31.12.2016 @11.50%.
Total Interest Earned = Tk. 20000 × 11.50% × 3/12 = Tk. 575.
Weighted average annual investment = Tk. 20000 × 3/12 = Tk. 5000.

Now:
◘ Total Interest Earned = Tk. 1250 + 900 + 575 = Tk. 2725.
◘ Weighted Average Annual Investment To Earn The Interest = Tk. 10000 + 7500 + 5000 = Tk. 22500.

Therefore:
Overall Annual Rate of Interest = 2725/22500 = 0.121111.... = 12.11%.
আরও উদাহরন:
আপনি ছয় মাস ধরে আপনার ৬০০ টাকা বিনিয়োগ করেছেন . . . এই কথাটাকে একটু ঘুরিয়ে বলা যায়: আপনি সারা বছর ধরে ৩০০ টাকা বিনিয়োগ করেছেন।
==========
১০০০০ টাকা ১২ মাসের জন্য বিনিয়োগ করা মানে ১০০০০ টাকা ১২ মাসের জন্য বিনিয়োগ করা
১৫০০০ টাকা ৬ মাসের জন্য বিনিয়োগ করা মানে ৭৫০০ টাকা ১২ মাসের জন্য বিনিয়োগ করা
২০০০০ টাকা ৩ মাসের জন্য বিনিয়োগ করা মানে ৫০০০ টাকা ১২ মাসের জন্য বিনিয়োগ করা
==========
মোট সুদ = [১০০০০*১২.৫০%] + [৭৫০০*১২.০০%] + [৫০০০*১১.৫০%] = ১২৫০+৯০০+৫৭৫ = ২৭২৫ টাকা মোট আসল = ১০০০০+৭৫০০+৫০০০ = ২২৫০০ টাকা ওভারঅল বার্ষিক সুদের হার
= ২৭২৫/২২৫০০ = ১২.১১%

2.During the next tree plantation week, Mutual Trust Bank is considering planting trees in one of its own rectangular piece of land which is 90 feet long 66 feet wide. This is suspended by boundary wall of 5 feet height. It has been decided that trees will be planted leaving 5 feet and free from the wall in all four sides. It was been decide that the distance from one tree to another in both row and column will be 4 feet. What is the maximum numbers of trees that can be planted in the land?[City Bank MTO -2017] [Standard Bank MTO-2016] MTB MTO-2014]
Solution:
Given that,
The length of the field=90 feet
Possible length of the rectangle
= 90-(5*2)= 80 feet
Possible Width of the rectangle
= 66-(5*2)
= 56 feet
Possible trees in row
= (56/4)+ 1
= 15
And
Possible trees in Column
= (80/4) + 1
=21
Maximum tree
= 21*15
= 315

Ans: 315

❖Faculty of IBA,DU

❖NCC Bank MTO-2018

Question-1:The difference between simple & compound interest annually on same amount at 8% for 2 years is Taka 12.80, what is the principal amount?
[NCC Bank MTO-2018]
Solution:
Suppose,
The Principal of simple & Compound be =x
First case:Simple Interest
SI={(x*8*2)/100}
=4x/25
Second Case:
Compound Interest
$=\{x(1+8/100)^2\}-x$
$= x\{(1+2/25)^2\}-x$
$=x(27/25)^2-x$
=(729x/625)-x
=(729x-625x)/625
=104x/625
According to the question,
(104x/625)-(4x/25)=12.80
Or,104x-100x=625*12.80
Or, 4x=8000
Or, x=2000
Hence,the principal is both case 2000 tk
Answer:2000 TK

Question-2:Jaya can make 40 pancakes in a minute. Sally can make pancakes at half of Jaya's rate. What time will it need (in minute) to make 150 cakes, if sally have already made a start of 30 pancakes alone? [NCC Bank MTO-2018]
Solution:
Jaya can makes 1 minutes 40 pancakes
According to the question,
Sally can makes 1 minutes 20 pancakes
[Since Sally's Speed is half of Jaya]
Sally 20 pancakes made in 1 minutes
So, Sally 30 pancakes made in =30/20=1.5 minutes
Remaining pancakes=(150-30)=120
Both Sally & Jaya 1 minutes done
=(40+20)=60 pancakes

So,
Both 120 pancakes made in =120/60=2 minutes
Hence,Total time taken to make 150 pancakes
=(1.5+2)=3.5 minutes
Answer:3.5 minutes

❖IBBL PO-2017

1.The costs of equities of symbol A and symbol B (in dollars) are two different positive integers. If 4 equities of symbol A and 5 equities of symbol B together costs 27 dollars, what is the total cost of 2 equities of symbol A and 3 equities of symbol B in dollars?
[Nova's GRE MATH Bible][IBBL PO-2017]
Solution:Math Fact:
[এখনে বলা হয়েছে A & B টাইপের দুটো Equities এর দাম ভিন্ন। But এখানে এটা বলা হয়নি যে A and B টাইপের প্রতিটা equities দাম ভিন্ন।
তাই এখানে দেখা যাচ্ছে প্রতিটা equities এর দাম 3 Tk হলেও type A & Bএর দাম যথাক্রমে 12 & 15 Tk যা ভিন্ন পূর্ণ সংখ্যা নির্দেশ করে]

X and Y be cost of the equities type of A & B
The cost of 4 equities of A=4 X
The cost of 5 equities of B=5Y
According to the question,
4X + 5 Y =27
Let,
4X=P
5Y=Q
So P is multiple of 4 & Q is multiple of 5
Now
P+Q=27
Or, P=27-Q
Since,Q is multiple of 5
Q=5,10,15,20-------etc

Q=5; P=27-5=22 is not multiple of 4
Q=10;P=27-10=17 is not multiple of 4
Q=15;P=27-15=12 is multiple of 4
Q=20;P=27-20=7 is not multiple of 4
So
Q=15
P=12
Now
P=4X
Or,X=12/4=3

Q=5Y
Or,Y=15/5=3
Therefore,
2 equities of A & 3 equities of B
=2X+3Y
=2*3+3*3
=6+9
=15
Answe:15

2.In what ratio must a grocer mix two varieties of tea worthTk 60 a kg & 65 a kg so that by selling the mixture at Tk 68.20 a kg he may gain 10% ? [GRE Big Book]
[Islami Bank PO -2017][Exim Bank-2016][Indian Bix]
Solution:
Let
The grocer buy 60 Tk kg=x kg
The grocer buy 65 Tk kg =y kg
The cost price of (x+y) kg
=(60x+65y) Tk
And selling price of (x+y) kg
=68.20(x+y) Tk
10% profits selling price
=110%(60x+65y)
According to the question,
68.20(x+y)=110%(60x+65y)
Or,22x =33y
X:Y=3:2
Answer:3:2
Alternative way====
According to the question,
Selling price-cost price=profit
68.20(X+Y)-(60X+65Y)=
10% of(60x+65y)
Or,X:Y=3:2
Answer:3:2

Short Cut:

10% profits sp=110 Tk
Cost price=(100*68.20)/110
=62 Tk

60----------65

62

(65-62) (62-60)
=3. =2
Answer:3:2

UCBL PO-2017

1. The simple interest on a sum of money will be tk 600 after 10 years. If the principal is trebled after 5 years, what will be the total interest at the end of the tenth year?[Dhaka Bank -2016] [UCBL PO-2017]
Solution:
Here,
10 y. interest=600 Tk
1 yrs. interest=600/10=60 Tk
5 yrs interest=(60*5)=300 tk

When principal is trebled then interest will be also be trebled
=(60*3*5)
=900 tk(Last 5 five yrs)

Total interest in 10 years
=(300+900)
=1200 Tk
Answer:1200 Tk

2.Mr X signed a contract for building a road for 1920 meters long within 120 days.He employed 160 workers for this task.But after 24 days he found that only 1/8 of the task has been finished .If Mr.X wants to finish the road in time how many additional workers he has to employ ?[UCB PO-2017]
Solution:
Given that,
Total time to complete the task=120 days
Work already done=1/8 part
Now,

After 24 days Remaining time
=(120-24)=96 days
And
After 1/8 part work done,
Remaining task=(1-1/8)=7/8 part
24 days are needed to do 1/8 of the work by 160 workers
96 days are needed to do 7/8 of the work by
=[(160*24*8*7)/(1*96*8)]
=280 workers
Additional workers are needed
=(280-160)
=120
Answer:120

❖DBBL PO-2017

1.A ship has faulty engine sailed only 7 hours period 2 day that covers 59 km. if first day rate is 5 km less than second day but first day sailed 3 hours more than of second day. what's is the avg speed of second day?[DBBL PO-2017]
Solution:
Let,
First day rate=x km/h
2nd day rate=(x+5)km/h
2nd time taken=y hrs
So,First day time taken=(y+3)hrs
From question First condition
y+(y+3)=7
Or, y=2
Second day time taken 2 hrs
First day taken=5 hrs
According to the question,
X*5+2*(X+5)=59
{Distance=Speed*Time}
Or,x=7
Second speed=12 km/hr
Answer:12 km/hr

2.In a class 25 students, 10 have less than 6 marbles, 10 have more than 7 and 4 have more than 8. how many have more than 5 less than 9 marbles?[DBBL PO-2017]
Solution:
Here,
The Number of Students has,
Less than 6 marbles=10

More than 7 marbles=10
More than 8 marbles=4
Let,
The Number of Students has more than 5 less than 9 marbles=x
Required condition= 5<x<9
So, x=25-10-4=11
Ans: 11 Students
NOTE:
Required condition... 5<x<9
Now 10 have less than 6, that means 10 have at least 5..(not fulfill condition) and 4 have more than 8 that means 4 have at least 9..(not fulfill condition)
So student x = 25-(10+4)=11

3.Bluepaint and yellow paint ratio 1:2 cost 110 and 100 per ltr. mixture of two paint made green color sell 120 per ltr. if he get 2000 tk profit how much yellow paint kg use.?
Solution:[DBBL PO-2017]
Let,
Blue paint= x kg
Yellow paint=2x kg
Cost price of Blue & Yellow paint
=110*x+100*2x
=310 x
Selling price of Green paint
=3x*120
=360x
We know that
Selling price-cost price=profits
According to the question,
360x-310x=2000
On solving, we get x=40
So, Yellow paint=2x =2*40=80
Ans: 80 Kg

4.A man has 100 balls, 50 red and 50 black sell 48 each. if black sell 20% loss and red sell 20% profit. What is the net profit or loss in tk? [DBBL PO-2017]
Solution:
Selling price of Red balls=50*48=2400
Selling price of Black balls=50*48=2400
Total selling price=4800tk
CP of Black balls=(2400*100)/80
=3000 Tk
CP of Red balls=(2400*100)/120
=2000 Tk

Total cost price=5000 Tk
Net Loss=(5000-4800)= 200 Tk

Ans:200 tk.

❖DBBL AO-2017

01.A number consists of three digits whose sum is 10.The middle digit is equal to the sum of the other two and the number will be increased by 99 if these two digit are reversed.What is the number?[DBBL AO-2017]
Solution:
Let,
Unit digit = x, Tenth digit = y & Hundred digit = z
So, The original number
=100z+10y+x
1st condition,
x+y+z=10----------(1)
2nd condition,
y=x+z----------(2)
If unit digit & Hundred digit are interchanged their place the new number is =100x +10y +z
According to the question,
(100x +10y +z)-(100z+10y+x)=99
Or, z=x-1----------(3)
Putting the value of z in equation(2)
y= x+x-1
Or, y=2x -1----------(4)
again,
Putting the value of y and z in equation(1)
x+2x -1+x -1=10
Or, x=3
Now,putting the value of x in equation(4)
y=5

Putting the value of x & y in equation(1)
Z=2
Hence, the original Number is
= (100*2)+(10*5)+3
=253
Answer:253

02.A picnic was arranged by 'm' students.Total cost of picnic was estimated to be 'y' Tk.Unfortunately, z students withdrew their names from the picnic.How many more tk would each of the remaining students have to pay? [DBBL AO-2017]
Solution:
Given that,
Total student = m
&
Total cost of picnic was estimated to be= y tk
So Cost per student was = y/m Tk
Since z student withdrew their name from picnic,
Now remaining student=(m-z)
And
Nwe cost per student is = y/(m-z)
So, Extra cost needed for rest of the stds now = y/(m-z) -y/m
= yz/m(m-z) Answer: yz/m(m-z)

➢ Bangladesh Tourism Board-AD-2017

01. A worker was hired for 7 days. The 2nd day he was paid tk.10 more each day than what he was paid the previous day of the work. The total amount he paid in the 1st 4 days of work equal to the total amount he was paid in last days, what is starting pay?
[Bangladesh Tourism Board-AD-2017]
Solution:
Let,
Salary of the 1st day = X
∴ 2nd to 7th day salary was (x+10), (x+20), (x+30), (x+40), (x+50), (x+60) respectively
According to the question, x+x+10+x+20+x+30=
x+40+x+50+x+60
Or, 4x+60= 3x+150
Or, x= 90
∴ Starting pay was= Tk.90
Answer: Tk 90

02.Arif's salary is twice that of Babu's salary. Kabir's salary is 1/3 of Arif's and Malek's salary is 2/3 of that Babu's salary.Total salary of kabir and Malek are what proportion of Babu's salary?
[Bangladesh Tourism Board-AD-2017]
Solution:
Let,
Babu's salary= X
∴ Arif's salary= 2X
Kabir's salary= 1/3 × 2X = 2x/3 Malek's salary= 2/3× X = 2x/3
∴ Required proportion
= (Kabir+ Malek): Babu

= (2x/3 + 2x/3): X
= 4:3
Answer:4:3

03. A, B and C of them working alone can complete a job in 6,8,12 days respectively. If all three of them work together to complete a job and earn Tk. 2340 what will be C's share
[Bangladesh Tourism Board-AD-2017]
Solution:
In 1 day,
A, B and C alone can do
1/6, 1/8 and 1/12 part of the work respectively
Ratio of their working rate
∴ A: B: C= 1/6:1/8:1/12
= 4:3:2 [Multiply by 24]
∴ Sum of the ratio= 4+3+2= 9 ∴ C's share=Tk. (2340 × 2/9) = Tk.520
Answer: Tk.520

➢ BAPEX AM-2017

01. A drink contains 20% mango juice, 20% guava juice and 60% apple juice. You added 250ml of water to 750 ml of the drink. Now what will be the ratio of water to apple juice in the diluted drink?[BAPEX ASSISTANT MANAGER GENERAL 2017]
Solution:
Given that,
A drink contains 20% mango juice, 20% guava juice
and
60% apple juice.
∴ The ratio of mango, guava and apple juice
= 20: 20: 60
=2:2:6
= 1:1:3
∴ The sum of the ratio
= (1+1+3) =5
∴ The quantity of apple juice
= (750 x 3/5) = 450 ml
Here also given that, 250 ml water is added in 750 ml of the drink.
So the ratio of water and apple juice in the drink
= 250:450
=25:45=5:9 Answer:5:9

02.Mr Rahman invested a certain sum of money in a bank that paid simple interest. The amount grew to tk. 240 at the end of 2 years. He waited for another 3 years and got a final amount of Tk. 300. What was the principal amount that he invested at the beginning?
[BAPEX ASSISTANT MANAGER GENERAL 2017]

Solution:
Given that,
5 years interest+Principal=Tk.300
2 years interest+Principal=Tk.240

[Minus] 3 years interest =Tk.60
2 years interest =[(60*2)/3]
= Tk 40
Hence,
Principal =Tk.(240-40)=Tk.200
Answer:200 Tk

Bangladesh Gas Fields Company Ltd-2017

1.It takes 120 metric tone water to sink a ship.Through a hole in the full of the ship,water is entering the ship at a rate of 2 metric tone per minute. At the same time,water is being pumped out at the rate 1.5 metric tone per minute using one pump. After 1 hour and 20 minutes another pump of same capacity was started. How much more time will it take to pump all the water out of the ship?
[BGFCL-2017]
Solution:
Here,
Water enter ship per minute
=2 metric tone
Water pumped out per minute
=1.5 metric tone
Water entered more per minute
=(2-1.5)=.5 metric tone
**After 1 hr & 20 minutes or 80 minutes
Water poured =(80*.5)=40 MT
After 80 minutes another capacity
pumped out pump started
So two pump pumped out water per minute=(1.5+1.5)=3 metric. tones
And 1 minute more water
pumped out=(3-2)=1 metric tone
Now,

1MT pumped out =1 minute
40 «»«»«»«»«»«»«»«=(40*1)/1
=40 minutes
Answer:40 minutes

➢ Bangladesh Gas Field Assistant Account-2017

1.Mr X invested his capital in two parts,one at 6% and another at 7% .At the end of two years he received Tk 354 as interest at all.If one fourth of first part of his investment is equal to one fifth of second part of investment.What was his total investment in his business?
[Bangladesh Gas Field Assistant Account/Finance-2017]
Solution:
Suppose,
First portion=x
Second portion=y
According to the First condition,
x/4=y/5
Or, x=4y/5----------(1)
And,
Second condition,
{(x*6*2)/100}+{(y*7*2)/100}=354
Or, y=1500
From (1) equation,
x=(4*1500)/5=1200
So,Total amount he invest
=(1200+1500) Tk
=2700 Tk
Answer:2700 Tk

❖Jamuna Bank MTO-2017

1.Minhaz and Alam can complete a work in 18 days.After working together for 12 days Minhaz stops and Alam completes the remaining work in 8 days.In how many days can Minhaz complete the work if he works alone?
[Jamuna Bank MTO-2017]
Solution:
In 18 days ,
They can complete=1 portion work
In 12 days ,
They can complete=12/18=2/3 parts of work
Remaining work=(1-2/3)=1/3 parts
Now,
1/3 part of work done by Alam=8 days

1 or full parts work done by Alam =8*3=24 days
Minhaz can do in 1 day =
{1/18-(1/24)}=1/72 parts
That's Means 1/72 part of work is done by Menhaz in 1 day
So,Full or 1 portion of work is done by Menhaz 72 days
Answer:72 days
Alternative:
For MCQ
18(M+A)=12(M+A)+8A
=>6M=2A
=>M:A=2:6 or 1:3
So,
4*18=1*D
=>D=72 (Ans.)

2.Thirsty percent of the members of a swimming club have passed the lifesaving test.Among the members who have not passed the test,12 have taken the preparatory course and 30 have not.How many members are there in the swimming club?[Jamuna Bank MTO-2017]
Solution:
Total members of the club be x
Number of members passed=x of 30%=3x/10
Number of members failed=(100-30)=70% of x=7x/10
According to the question,
7x/10=12+30
Or, x=60
Answer:60

Q.Minhaz and Alam can complete a work in 18 days.After working together for 12 days Minhaz stops and Alam completes the remaining work in 8 days.In how many days can Minhaz complete the work if he works alone?
[Jamuna Bank MTO-2017]
Solution:
In 18 days ,
They can complete=1 portion work
In 12 days ,
They can complete=12/18=2/3 parts of work
Remaining work=(1-2/3)=1/3 parts
Now,
1/3 part of work done by Alam=8 days
1 or full parts work done by Alam =8*3=24 days
Minhaz can do in 1 day =
{1/18-(1/24)}=1/72 parts
That's Means 1/72 part of work is done by Menhaz in 1 day
So,Full or 1 portion of work is done by Menhaz 72 days
Answer:72 days
Alternative:

For MCQ
18(M+A)=12(M+A)+8A
=>6M=2A
=>M:A=2:6 or 1:3
So,
4*18=1*D
=>D=72

Answer:72

3: A box contains only marbles. If 1/4th of the marble were removed from the box would be filled to 1/3 of its capacity.If instead of 100 marbles were added,the box would be full.How many marbles are there in the box?
[Jamuna Bank MTO/PO-2017]

Solution:
Let,
Total capacity of the box=1 portion

The marble in the box begging=x

First1/4 th of the marble removed from the box
=x*1/4 portion
=X/4 portion
Remaining marbles in the box
={x-(x/4)}
=3x/4 portion

According to the question,
1/3 of the capacity of box =3x/4 marbles
Full capacity of the box =9x/4 marbles
::
Now ,100 marbles were added to the "x" marbles then the box full its capacity
So,
x+100=9x/4
Or, (9x/4)-x =100
Or, 5x =400
Or, x=80
Hence,The marble in the box 80
Answer:80

*যদি প্রশ্ন এটা হয় :

Question:A box only contains marbles. If you remove 1/4th of the marble from the box, then 1/3rd of the box is empty. Now if you added 100 marbles, the box will be full. How many marbles were there in the box?

Solution:
Total capacity of the box=1 portion
Let,
The marble in the box begging=x

1/4 th of the marble removed =x*1/4 portion
=X/4 portion
Remaining marble
={x-(x/4)}
=3x/4 portion
According to the question,
(1-1/3)=2/3 of the capacity of box =3x/4 marbles
Full capacity of the box =9x/8 marbles
::
Now ,100 marbles were added to the "x" marbles then the box full its capacity
So,
x+100=9x/8
Or, (9x/8)-x =100
Or, x/8 =100
Or, x=800
Hence,The marble in the box 800
Answer:800

KSB Senior Officer-2015

1.Mr X invested his capital in two parts,one at 6% and another at 7% .At the end of two years he received Tk 354 as interest at all.If one fourth of first part of his investment is equal to one fifth of second part of investment.What was his total investment in his business?
Solution:
Suppose,
First portion=x
Second portion=y
According to the First condition,
x/4=y/5
Or, x=4y/5----------(1)
And,
Second condition,
{(x*6*2)/100}+{(y*7*2)/100}=354
Or, y=1500
From (1) equation,
x=(4*1500)/5=1200
So,Total amount he invest
=(1200+1500) Tk
=2700 Tk
Answer:2700

2.প্রতি কেজি ধান ও গমের মূল্য যথাক্রমে ২০ টাকা এবং ৪০ টাকা। গমের ফলন আশাতীত হলেও ধানের ফলন আশানুরূপ না হওয়ার প্রতিদিন প্রতি কেজি গমের মূল্য প্রথমদিনের মূল্যের ৫% হারে কমতে এবং প্রতি কেজি ধানের মূল্য প্রথম দিনের মূল্যের ১০% হারে বাড়তে শুর করলো। কতদিন পর এবং কোন মূল্যে প্রতি কেজি ধান ও গমের মূল্য সমান হবে ?[Sonali Bank SO-2010]
সমাধান:মনে করি,
x দিন পর ধান ও গমের মূল্য সমান হবে।
১ দিন ধানের মূল্য বাড়ে ২০ এর ১০%=২ টাকা
x দিনে ::::::::::::::::::::::::::::::::::=২x টাকা
x দিন পর ধানের মূল্য (২০+২x)টাকা

১ দিন গমে মূল্য কমে ৪০ এর ৫%=২ টাকা
x দিনে ::::::::::::::::::::::::::::::::::=২x টাকা
x দিন পর গমের মূল্য (৪০-২x) টাকা
প্রশ্নমতে,
৪০-২x=২০+২x
Or, x =৫
৫ দিন পর ধান/গমের মূল্য হবে=৪০-২*৫=৩০ টাকা
সুতরাং ৫ দিন পর এবং ৩০ টাকা মূল্যে প্রতি কেজি ধান ও গমের মূল্য সমান হবে
উওর: ৩০ টাকা, ৫ দিন পর

KSB Officer-2015

1. আবুলের সাপ্তাহিক বেতন ১৬ শতাংশ বৃদ্ধি পেলে, তিনি প্রতি মাসে ৮১২ টাকা উপার্জন করতে পারেন। যদি তার সাপ্তহিক বেতন ১০ শতাংশ বৃদ্ধি পেত, তিননি প্রতি মাসে কত টাকা উপর্জন করতেন?

[JBC AM-2016]

Solution:
Weekly wage 16% increase,
When weekly wage increase 116 tk then monthly wage 812 tk
When weekly wage 110 tk then monthly wage ={(812*110)/116}
=770 tk

Answer:770 tk

JBC AM-2016

1. আবুলের সাপ্তাহিক বেতন ১৬ শতাংশ বৃদ্ধি পেলে, তিনি প্রতি মাসে ৮১২ টাকা উপার্জন করতে পারেন। যদি তার সাপ্তহিক বেতন ১০ শতাংশ বৃদ্ধি পেত, তিননি প্রতি মাসে কত টাকা উপর্জন করতেন?[JBC AM-2016]

Solution:
Weekly wage 16% increase,
When weekly wage increase 116 tk then monthly wage 812 tk
When weekly wage 110 tk then monthly wage ={(812*110)/116}=770 tk Answer:770 tk

2. দুটি ট্রেন ৩০ কিমি/ঘন্টা এবং ৬০ কিমি/ঘন্টা বেগে একে অপরের বিপরীত দিকে চলতে। এদর দৈর্ঘ্য যথাক্রমে ১.১৫ কিলোমিটার এবং এবং ০.৬৫ কিলোমিটার হলে ধীরগতির ট্রেনটির দ্রুতগতির ট্রেনটিকে অতিক্রম করতে কত সেকেন্ড সময় লাগবে?[JBC AM-2016]

Solution:
Since,the trains are moving opposite direction,
So,Relative speed
=(30+60)=90 km/hr
=90*5/18=25 m/s
Total length of trains
=(1.15+.65)=1.8 km
=1800 m
Time taken to cross slower train to speed ones
=1800/25
=72 seconds
Answer:72 seconds

JBC JO-2009

1.50 junior officers of a bank have different professional background.Of these, 22 have MBM degrees, 15 have Banking diploma & 14 have M.Comin banking.9 of the employees have two of the degrees & One has taken all three of the degrees.How many have none of the degrees.
[JBC JO-2009]

Solution:
Here,
One of the employees has taken all of the courses
Nine of the employees have taken exactly of the courses
Number of employee have taken only MBM ={ 22–(9 + 1)}=12
Numbers of employee have taken only Banking diploma
={15–(9 + 1)}=5
Numbers of employee have taken only M.COM =14–1=13
Numbers of total employee have taken at least one course
=(12 +5+13+9+1)= 40 So,
Employees who have not taken any course =50–40 =10 Answer:10

2.A labourer is paid Tk 20 per hour for an 8 hour day.If he works overtime in a single day,he is paid 1.5 times the rate he is paid for regular hours.If the labourer received Tk 200 for a single day's work,then how long did he work on that day?[JBC JO-2009]

Solution:
Suppose,
Total working x hrs
Overtime paid=20*1.5=30 TK
According to the question,
20*8+(x-8)30=200
Or, x=9.33
Answer:9.33 hrs or 9 hrs 20 minutes

3.In a group of people solicited by a charity, 30% contributed Tk 40 each,45% contributed Tk 20 each & the rest contributed Tk 2 each.If the charity received a total of Tk 300 from the people who contributed Tk 2,how much was contributed by the entire group? [JBC JO-2009]

Solution:
2 tk each person=300/2=150
2 tk each person percentage
=(100-30-45)=25%
According to the question,
25% people=150
30% people=180a
45% people=270
Total contribute entire group
=300+180*40+270*20
=12,900 tk
Answer:12,900 TK0 Tk

Jamuna Bank MTO-2016

1.Karina has a wheat business.She purchases wheat from a local wholesaler at aparticular per pound.The price of the wheat at her local is tk.30 per kg.His faulty springbalance reads.0.90 per kg for a kg.Also in the festival season she gives 10%discount on the wheat.She found that he made neither a profit nor a loss in the festival season. At what price did Karina purchase the wheat from the wholesaler? [Jamuna Bank MTO-2016][GMAT]
Solution:
Here
Market price=30 Tk per kg
10% discount after price per kg
=(30-30 of 10%)
=27 Tk
But he sells .9 kg in stead of 1 kg
So,SP =(.9*27)
=24.3 Tk per kg
Which should be her cost price
We know,
2.2 pound =1 kg
Cost price per pound
=24.3/2.2
=Tk 11.045 per pound
Answer: Tk11.045 per pound

2. According to the stock policy of a company each employee in the division is given 15 shares of the company and each employee in the recruitment division is given 10 shares.Employees belonging to both the communities get 25 shares each.There are 20 employees in the company and each of them belongs to at least one of the division.The cost of each share is tk.10.If the technical division has 15 employees and the recruitment division has 10 employees, then what is the total cost of the shares given by the company?[Jamuna Bank MTO-2016]

Solution-1:

Given that,
The number of employees in the technical & recruitment division be 15 & 10 respectively
Agian
Each technical person & each recruitment person given 15 & 10 share respectively
Hence the net share given equals
=(15*15)+(10*10)
31
=325
So the net worth of the share
=(325*10)
=3250 Tk Answer:3250 Tk

Solution-2:

Shares :
Technical -15
Recruiting -10
Both-25
No. of employees :
Technical -15
Recruitment -10
Total-20
Both=25-20=5
so, employees only in Technical =15-5=10
Employees in recruiting =10-5=5
Per share price: 10 Tk
Cost of both-25*5*10=1250
cost of recruiting -10*5*10=500
cost of technical -15*10*10=1500
Totals=1250+500+1500=3250
Ans: Tk.3250
Solution-3:
Let,
Employee of both is x
ATQ,
15+10-x=20
on solving, we get x = 5
only technical division employee= 15-5=10
only recruitment division employee= 10-5=5

Total price of shares = (10*15+ 5*10+5*25)10= 3250 Ans: Tk.3250

➢ NCC Bank MTO-2015

1.Before the budget,a businessman had increased the price of his product 12%. in the budget a 10% sale tax(to be paid by the seller) was imposed on that product.As a result the profit ultimately increased by Tk 64,what was the original selling price? [NCC Bank MTO-2015]
Solution:
Let,
Original price=100 TK
20%Increased price then new price=112 TK
After giving 10% sale tax, then
Selling price=112-112 of 10%=100.8 tk
Profit increased=100.8-100)=.8 TK
So,
Original selling price
={(64*100)/0.8}
=8000 tk
Answer:8000 TK

2. Ayisha's age is 1/6 of her fathers age. Ayishas fathers age will be twice the shankar's age after 10 years. If shankar's eighth birthday celebrate two years before,what is the present age of Ayisha?
[NCC Bank MTO-2015]
Solution:
Let,
Ayisha's age be x
And Her father be 6x
From question condition,
Shanker=(6x+10)/2
=3x+5
According to the question,
3x+5=8+2+10
Or, x=5
Hence,Ayisha's age is 5 years
Answer:5 Years

BCSIC AM-2016

1:Six pipes are fitted to a water tank. Some of these are inlet pipes and the others outlet pipes . Each inlet pipe can fill the tank in 9 hrs and each outlet pipe can empty the tank in 6 hrs.On opening all the pipes, an empty tank is filled in 9 hrs. How many inlet pipes are there?

[BCSIC AM -2016

Solution:
Give that,
Total no. of pipes=6.
Let no. of inlet pipes be x.
Then, no. of outlet pipes will be
(6-x).
Part of tank filled by 1 inlet pipe in 1h= 1/9.
So, Part of tank filled by x inlet pipes in 1h= x/9.
Similarly,
Part of tank emptied by 1 outlet pipe in 1h=1/6.
So, Part of tank emptied by (6-x) outlet pipes in 1h= (6-x)/6.
Now when both of them are opened at the same time:-
Part of tank filled in 1h
= (x/9) - (6-x)/6 = (15x-54)/54.
in 9h tank filled
={(15x-54)*9/54}
= (15x-54)/6,
which must be equal to 1
(as tank gets filled in 9h)
So,{(15x-54)/6}=1
=> (15x-54)=6.
=> 15x=60.
=> x=4.
Thus the solution is:- there are 4 inlet pipes and 2 outlet pipes.
Ans:4

BAPEX Auditor/Finance AM-2016

Q-1.Alim and Badrul enter in to a partnership and Alim invests tk.10,000 in the partnership.At the end of 4 months he withdraws tk.2000. At the end of another 5 months, he withdraws another tk.3000. If Badrul invests a certain sum in the partnership at the beginning of the year and leaves it intact and receives tk.9600 as his share of the total profit of tk.19,100 for the year, how much did Badrul invest in the company?

[BAPEX Auditor/Finance AM-2016]

[MTO MTO MCQ-2014

Solution:
Alim invest in the business in a year
={10,000*4+(10000-2000)*8+10000-(2000+3000)*3}
=95000 tk
The total profit for the year is 19100 tk
Of this Badrul gets tk.9600.
Therefore, Alim would get
(19100 – 9600) = tk.9500.
Suppose,Badrul invest in the business=x
So,
95000:x=9500:9600
Or, x={(95000*9600)/9500}
Or, x=96000
Badrul for 12 months invest 96000 tk
So, Badrul initial investment
=96000/12=8000 TK
Answer:8000 tk

Q-2.Two merchants sell, each an article for tk.1000. If Merchant A computes his profit on cost price, while Merchant B computes his profit on selling price, they end up making profits of 25% respectively.
[BAPEX Auditor/Finance AM-2016]
[MTO MTO MCQ-2014]
Solution:
B computes his profit as percentage of selling price
Hence,His profit
=1000 of 25%=250 tk

For Merchant A: Computes his Profit on cost
25% profit selling price=125 tk
Cost price of merchant A
={(100*1000)/125}
=800 tk
Merchant A profit

=(1000-800)=200 tk

Hence, B makes (250-200)=50 tk more than A

Answer:50 TK

Bangladesh Krishi Bank Senior Officer-2015

01:একটি আয়তাকার বর্গের দৈর্ঘ্য ৮ মিটার ও বর্গের উপর বিপরীত শীর্ষ হতে অংকিত লম্বের র্দেঘ্য ৪ মিটার হলে আয়তাক্ষেত্রের ক্ষেত্রফল কত ?[Bangladesh Krishi Bank Senior Officer-2015]

Solution:

ABCD একটি আয়তক্ষেত্র AC কোনের দৈর্ঘ্য ৮ মিটার বর্নের উপর শীর্ষ বিন্দু D হতে ৪ মিটার দৈর্ঘ্যর একটি অংকন করা হলো।

We know, বিপরীত শীর্ষ হতে কর্নের উপর অংকিত লম্ব কর্নকে সমদ্বিখন্ডিত করে।

সুতরং

< ODC এবং < ODA একটি সমকোনী ত্রিভুজ

এখন, < ODC,4

$DC^2 = OD^2 + OC^2$

$OC = OA = \frac{8}{4} = 4$

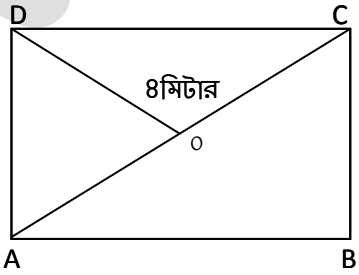
বা, $DC^2 = (4)^2 + (4)^2$

বা, $DC^2 = 16 + 16$

বা, $DC^2 = 32$

বা, $DC^2 =32$

বা, $DC = 4\sqrt{2}$



আবার,

< ODA একটি সমকোনী ত্রিভুজ

$AD^2 = OD^2 + OA^2$

বা, $AD^2 = (4)^2 + (4)^2$

বা, $AD^2 = 16 + 16$

বা, $AD^2 = 32$

বা, $AD^2 = 32$

বা, $AD = 4\sqrt{2}$

আয়তক্ষেত্রের ক্ষেত্রফল = দৈর্ঘ্য × প্রস্থ

= AD × DC

= $4\sqrt{2} \times 4\sqrt{2}$

= 32 বর্গ মিটার

উত্তর : 32 বর্গ মিটার।

02:A water tank can be filled by two pipes.A and B in 60 minutes and 40 minutes respectively to fill the pipe.How Many minutes will it take to fill the tank from empty state if B is used for half the time and A&B fill it together other half ?

[Bangladesh Krishi Bank Senior Officer-2015]

Solution:

let,

Total time taken to fill the empty tank=X minutes

Total water hold = 1 portion

According to the question,

$$\frac{1}{40} \times \frac{x}{2} + \left(\frac{1}{40} + \frac{1}{60}\right)\frac{x}{2} = 1$$

$$\frac{x}{80} + \left(\frac{3+2}{120}\right)\frac{x}{2} = 1$$

$$\frac{x}{80} + \frac{5}{120} \times \frac{x}{2} = 1$$

$$\frac{x}{80} + \frac{x}{48} = 1$$

$$\left(\frac{3x + 5x}{240}\right) = 1$$

$$\frac{8x}{240} = 1$$

$$x = \frac{240}{8}$$

$$x = 30$$

Ans: 30 minutes

03:A can do a piece of work in 30 days,B can do it in 15 days and C can do it in 10 days.Every second days B and every third days C help A .How many days will finish the whole work?]
[Bangladesh Krishi Bank SO-2015]
Solution:
Let,
Total work=1 portion
LCM of 2 & 3=6
Per 6 days A work= 6 days
Per 6 days B work=(6/2)=3 days
Per 6 days C work=(6/3)=2 days
So,
6 days (A+B+C)'s work
=(6/30+3/15+2/10) portion
=3/5 portion
Remaining work
=(1-3/5) portion
=2/3 portion
After 2 days(A+B)'s work
=(2/30+1/15)portion
=2/15 portion
[Every second days B help A]
Remaining work
=(2/5-2/15) portion
=4/15 portion
Total time=(6+2)=8 days
9th day(A+C) work
=(1/30+1/10) portion
=2/15 portion
Remaining work
=(4/15-2/15)portion
=2/15 portion
Another 2 days(A+B)'s work
=(2/30+1/15) portion
=2/15 portion
Remaining work
=(2/15-2/15)
=0
So total time taken to finish the work=(9+2)=11 days
Answer:11 days

01.একটি সামান্তরিকের ক্ষেত্রফল 140 বর্গে সেমি। একটি কর্নের দৈর্ঘ 28 সেমি হেল অপর কৌনিক বিন্দু হতে কর্ণের উপর অংকিত লম্বে দৈর্ঘ্য কত ? [Bangladesh Krishi Bank Officer-2015]

Solution:

সামান্তরিকের কর্ন সামান্তরিক কে সমান দুই ভাগে ভাগ করে।

অতএব, এক অংশের ক্ষেত্রফল = = 70 বর্গ মিটার ।

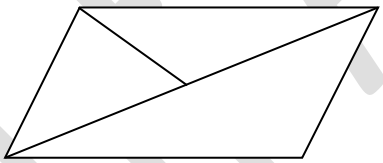
ধরি,

নতুন ভাবে প্রাপ্ত $<$ ADB ত্রিভুজের ভুমি BD = 28 সেঃ মিঃ উচ্চতা = P

ত্রিভুজের ক্ষেত্রফল $= \frac{1}{2} \times$ ভুমি $\times$ উচ্চতা

$= \frac{1}{2} \times 28 \times P$

= 14P বর্গ সেঃ মিঃ



প্রশ্নমতে,

14P = 70

$P = \frac{70}{14}$

P = 5

কর্ণের উপর অংকিত লম্বের দৈর্ঘ্য = 5 সেঃ মিঃ।

নোট:

- সামান্তরিকের ক্ষেত্রফল
  = কর্ন $\times$ কর্নের উপর অংকিত লম্বের দৈর্ঘ্য = D $\times$ B
- পরিসীমা
  = 2(দৈর্ঘ্য + প্রস্থ)
- সামান্তরিকের কর্ন সামান্তরিকের ক্ষেত্রফলকে সমান দুই ভাগে ভাগ করে।

02.একটি বর্গক্ষেত্রের পরিসীমা একটি আয়তক্ষেত্রের পরিসীমার সমান। আয়তক্ষেত্রের দৈর্ঘ্য প্রস্থের ৩ গুণ এবং ক্ষেত্রফল ১২০০ বর্গমিটার। প্রতিটি ৫০cm বর্গকার পাথর দিয়ে বর্গক্ষেত্রটি বাঁধাতে মোট কতটি পাথর লাগবে ? [Bangladesh Krishi Bank Officer-2015]

সমাধান:
মনে করি,
আয়তক্ষেত্রের প্রস্থ x মি
আয়তক্ষেত্রের দৈর্ঘ্য ৩x মি
শর্তমতে,
$৩x^২=১২০০$
বা,$x^২=৪০০$
বা,$x=২০$
সুতরাং,
আয়তক্ষেত্রের প্রস্থ ২০ মি
আয়তক্ষেত্রের দৈর্ঘ্য ৬০ মি
আয়তক্ষেত্রের পরিসীমা
=২(৬০+২০)=১৬০ মি
যেহেতু একটি বর্গক্ষেত্রের পরিসীমা একটি আয়তক্ষেত্রের পরিসীমার সমান

সুতরাং বর্গক্ষেত্রের পরিসীমা =১৬০ মি
এবং বর্গক্ষেত্রের একবাহু ৪০ মি
তাই বর্গক্ষেত্রের ক্ষেত্রফল
=(৪০*৪০)=১৬০০ বর্গমি
প্রতিটি পাথরের দৈর্ঘ্য ৫০ সে.মি
=০.৫ মি.
প্রতিটি পাথরের ক্ষেত্রফল
=(০.৫*০.৫)বর্গমি
=০.২৫ বর্গমি.
সুতরাং প্রতিটি ৫০cm বর্গকার পাথর দিয়ে বর্গক্ষেত্রটি বাঁধাতে মোট পাথর লাগবে=১৬০০/০.২৫
=৬৪০০ টি
উওর:৬৪০০ টি

Bangladesh Krishi Bank Officer Cash-2015

১.রেহানা তার আয়কৃত টাকা থেকে ভ্যাট ব্যতিরেখে মোট টাকার ৫০% কাপড়,২০% খাবার এবং ১০% অন্যান্য বাবদ খরচ করেন। তিনি কাপড়বাবদ ভ্যাট দেন ৪% অন্যান্য বাবদ ভ্যাট দেন ৮%।খাবার বাবদ তিনি কোন ভ্যাট দেন না। তার প্রদানকৃত ভ্যাট ব্যয়কৃত টাকার কত শতাংশ?[BKB Cash-2015]
সমাধান:

Let,
Total income of রেহানা 100 TK
So,She expenditure of purchase cloth =50 tk
Food=20 tk
Others=30 tk
She paid VAT on
Clothes =50 of 40%=2 tk
Others=30 of 8%=2.4 TK
Hence,Total expenditure
=50+20+30+2+2.4=104.4 tk
সুতরাং প্রদানকৃত ভ্যাট ব্যয়কৃত টাকার
={(4.4*100)/104.4}
=4.21%

২.ক,খ,গ তিন বন্ধু ২৫ জনকে চা পান করাবে। ক ১৫ জনকে খ ১০ জনকে চা পরিবেশন করে। পরে গ তার অংশের ৫০ টাকা দিল। তাহলে ক ও খ কে কত টাকা পাবে। [BKB Cash-2015]
Solution:
গ এর অংশ=৫০ টাকা
সুতরাং,ক+খ+গ এর মোট অংশ
=৫০*৩=১৫০ টাকা
এখন,
৩ জনের জন্য খরচ হয় ১৫০ টাকা
এবং ১ জনের জন্য খরচ হয়
=১৫০/৩ অংশ
=৬ টাকা
১৫ জনের জন্য ক এর খরচ হয়
=১৫*৬=৯০ টাকা
১৫ জনের জন্য খ এর খরচ হয়
=১০*৬=৬০ টাকা
সুতরাং
ক পাবে=৯০-৫০=৪০ টাকা
খ পাবে=৬০-৫০=১০ টাকা
উওর:৪০ টাকা ও ১০ টাকা

BADC(AO)2017

Q.এক ব্যক্তি ৪০ দিনে তার দালানের কাজ শেষ করার জন্য ২৫ জন লোক নিয়োগ দিলেন।২০ দিন পর তিনি আরো ১৫ জন লোক নিয়োগ দিলেন এবং কাজটি ৫ দিন আগে শেষ হয়ে গেল।অতিরিক্ত লোক নিয়োগ না দিলে তিনি নির্ধারিত সময়ের কতদিন পরে কাজটি শেষ করতেন?[BADC(AO)2017]

Solution:
25 Men 40 days done 1 portion W
25 Men 20 days done 20/40«»«»«
=1/2 portion
Remaining work=(1-1/2)
=1/2 portion
Remaining days=(40-20-5)=15 days
Total worker=(25+15)=40
40 worker 1/2 portion done 15 day
1========1/2========== 15*40
25======1/2=========(15*40/25)=24 days
If he had not engaged the additional men,Then he needed
(24-20)=4 days more to finish the whole work in stipulated time
Answer: 4 days
Alternative:
Let,
x day needed to completed the whole work.
Total target day = 40 d
Man = 25
After 20 days,
Days left = 40-20 = 20 d
& number of M = 25+15 = 40
Now, task will be completed before 5 days,means = (40-5) = 35 days
According to the question,
25x = 20*25 + 15*40
Or,x =44
So, Additional day=(44-40)=4 days
Ans:4 days

Q.একজন ব্যক্তি একটি বর্গক্ষেত্র জুড়ে আড়াআড়ি ভাবে হেটে গিয়েছিল।।প্রান্ত বরাবর না হাটার কারণে কত শতাংশ কম হাটতে হয়েছিল?[BADC(AO)2017]

Let,
Side of the square=1 unit
And Perimeter=4 unit
Half-perimeter=2
Accordingly,
The man walks diagonally,
diagonal=√(1+1)
=√2
=1.414
Save walking
=2-1.414
=0.586
Required%
=(0.586*100)/2

=29.3%
Answer:29.3%

Standard Bank MTO-2016

1.Suppose you deposited Tk 10000 on January 1. 2012 at 12.50% interest rate for 1 year. On July 1 2013 Tk15000 at 12% interest rate for 6 months and on October 1 2013 Tk 20000 at 11.5% interest rate for 3 months(assume that the stated interest rates are simple and annual). Suppose you withdrew all deposits including due interests on December 31. 2013. Calculate the overall annual rate of interest you have received.[MTB MTO-2014][SBL MTO-2016]

Solution:
#Investment_01:
•• Tk. 10000 from 01.01.2016 to 31.12.2016 @12.50%.
Total Interest Earned = Tk. 10000 × 12.50% × 12/12 = Tk. 1250.
Weighted average annual investment = Tk. 10000 × 12/12 = Tk. 10000.

#Investment_02:
•• Tk. 15000 from 01.07.2016 to 31.12.2016 @12%.
Total Interest Earned = Tk. 15000 × 12% × 6/12 = Tk. 900.
Weighted average annual investment = Tk. 15000 × 6/12 = Tk. 7500.

#Investment_03:
•• Tk. 20000 from 01.10.2016 to 31.12.2016 @11.50%.
Total Interest Earned = Tk. 20000 × 11.50% × 3/12 = Tk. 575.
Weighted average annual investment = Tk. 20000 × 3/12 = Tk. 5000.

Now:
◘ Total Interest Earned = Tk. 1250 + 900 + 575 = Tk. 2725.
◘ Weighted Average Annual Investment To Earn The Interest = Tk. 10000 + 7500 + 5000 = Tk. 22500.

Therefore:
Overall Annual Rate of Interest = 2725/22500 = 0.121111.... = 12.11%.
আরও উদাহরন:
আপনি ছয় মাস ধরে আপনার ৬০০ টাকা বিনিয়োগ করেছেন . . . এই কথাটাকে একটু ঘুরিয়ে বলা যায়: আপনি সারা বছর ধরে ৩০০ টাকা বিনিয়োগ করেছেন।
==========
১০০০০ টাকা ১২ মাসের জন্য বিনিয়োগ করা মানে ১০০০০ টাকা ১২ মাসের জন্য বিনিয়োগ করা
১৫০০০ টাকা ৬ মাসের জন্য বিনিয়োগ করা মানে ৭৫০০ টাকা ১২ মাসের জন্য বিনিয়োগ করা
২০০০০ টাকা ৩ মাসের জন্য বিনিয়োগ করা মানে ৫০০০ টাকা ১২ মাসের জন্য বিনিয়োগ করা
==========

মোট সুদ = [১০০০০*১২.৫০%] + [৭৫০০*১২.০০%] + [৫০০০*১১.৫০%] = ১২৫০+৯০০+৫৭৫ = ২৭২৫ টাকা মোট আসল = ১০০০০+৭৫০০+৫০০০ = ২২৫০০ টাকা ওভারঅল বার্ষিক সুদের হার
= ২৭২৫/২২৫০০ = ১২.১১%

2.During the next tree plantation week, Standard Bank is considering planting trees in one of its own rectangular piece of land which is 90 feet long 66 feet wide. This is suspended by boundary wall of 5 feet height. It has been decided that trees will be planted leaving 5 feet and free from the wall in all four sides. It was been decide that the distance from one tree to another in both row and column will be 4 feet. What is the maximum numbers of trees that can be planted in the land?[City Bank MTO -2017] [Standard Bank MTO-2016]
Solution:
Given that,
The length of the field=90 feet
Possible length of the rectangle
= 90-(5*2)= 80 feet
Possible Width of the rectangle
= 66-(5*2)
= 56 feet
Possible trees in row
= (56/4)+ 1
= 15
And
Possible trees in Column
= (80/4) + 1
=21
Maximum tree
= 21*15
= 315

Ans: 315

03. A total of Tk. 1200 is deposited in two saving accounts for one year portion at 5% simple interest and the rest at 7% simple interest. If Tk. 72 was earned as interest, how much was deposited at 5%? [Standard Bank MTO-2016]

Solution:

Let, Tk. x be deposited at 5% simple interest

and Tk. (1200-x) at 7%.

According to the question,

5% of x + 7% of (1200-x) =72

Or, 5x/100+ 7(1200-x)/100=72

Or, 5x+ 8400- 7x= 7200

Or, -2x= 7200-8400

Or, -2x= -1200

Or,x= 600

Hence,Tk. 600 is deposited at 5% simple interest.

Answer: Tk. 600

04. Mr. Akber is a potato seller in a local bazar. When he brings potato from the village market to his shop in the town, he has to pay a minimum of Tk. 100 toll up to total safe of Tk. 1000. For any amount of sale above Tk. 1000, he has to pay an additional toll of 7.5% on the increment amount. If total amount of toll paid was Tk. 257.50 then what were his total sales proceeds from the potatoes? **[Standard Bank MTO-2016]**

Solution:

Let, the increment amount is X Tk.

Toll on safety= Tk 100.

then toll on increment amount =(257.50-100)= 157.50 Tk.

Now, X*7.5%=157.50

Or, X*0.075=157.50

Or,X=2100

Hence Total sales=1000+2100 =3100 Tk Answer:3100 Tk

GTCL AM-2016

1.An old man distributed all the gold coins he had to his two sons into two different numbers such that the difference between the squares of the two numbers is 36 times the difference between the two numbers.How many coins did the old man have?

Solution:

Let,the number of coins one son got be x and the number of coins another got be y

Total =x+y

According to the question,

$X^2-y^2=36(x-y)$

Or, (x-y) (x+y)= 36(x-y)

Or, (x+y)=36

Answer:36

❖Faculty of Arts,DU

Rupali Bank Cash(Cancelled)-2018

Question-1:A man's salary in 2014 was tk 20,000 per month and it increased by 10% each year. Find how much he earned in the years 2015 to 2017 inclusive.
[Rupali Bank Cash Officer(Cancelled)-2018]
Solution:
Given that,
In 2014 his initial salary per month was
= 20000 tk
So,His annual salary in 2014 was
=20000*12=240,000 tk

And Also given that,Each year his annual salary increased by 10%
So, In 2015 his salary was
=240,000*110/100
=264,000 tk

In 2016 his salary was ,
=264,000*110/100
=290,400 tk
In 2017 his salary was
=290,400*110/100

=319,440

So total earned by him from 2015 to 2017 inclusive

= 264,000+290400+319440

=8,73,840 tk

Answer: 8,73,840 tk

Question-2:The profit of a company is given in Taka by $P = 3x^2-35x+50$, where x is the amount in Taka spent on advertising. For what values of x does the company make a profit?

[Rupali Bank Cash Officer(Cancelled)-2018]

Solution:
Here,
$P=3x^2 - 35x + 50$
Now,if the company makes profit,then P>0
So,
$3x^2 - 35x + 50 > 0$
$=> 3x^2 - 30x – 5x + 50 > 0$
$=> 3x(x-10) – 5(x-10) > 0$
$=> (x-10)(3x-5) > 0$----------(1)
As this equation(1) is greater than 0,So the value of the two roots must have different values in different intervals.
Now,the equation(1),we have
x>10
Or, the value of x less than 5/3 and greater than or equal to 0
i.e . $0 \le x<5/3$,Because advertising cost can not be negative
So, the company makes a profit,the values of $x=\{0 \le x<5/3$ or ,$x>10\}$

Answer:$x=\{0 \le x<5/3$ or ,$x>10\}$

Note:Why $x=\{0 \le x<5/3$ or ,$x>10\}$

$(x-10)(3x-5) > 0$----------(1)
যদি x> 10 হলে
x এর মান হব 11,12,13 ইত্যাদি।
যখন x=11 এর মান (1) নং সমীকরনে বসাই
(11-10)*(3*11-5)>0
Or, 28>0
যাহা প্রশ্ন এর দেওয়া শর্ত পূরন করতে।
তাই x>10
আবার
x>5/2 হয় তাহলে; x=2,2.5,2.6,7,8,9,10
x=2 হলে (১) নং সমীকরণ হতে পাই

(2-10)*(3*2-5)>0
Or, -8*1>0 Which is not acceptable under this condition.Because question said the company makes profit
So, x<5/2
আবার x=9 হলে,
(9-10)*(9*2-5)>0
Negative value >0 which is not acceptable under this question condition
So, the company makes a profit,the values of x={0 ≤ x<5/3 or ,x>10

Question-3:Find the three digit prime number whose sum of the digits is 11 and each digit representing a prime number. Justify your answer.[Rupali Bank Cash Officer(Cancelled)-2018]
Solution:
Since the sum of the 3 digits is 11 and each digit represents a prime number,
So, the number less than 11 .
And the 3 digits may be 2,2,7 or 3,3,5
Because 2+2+7=11 and 3+3+5=11
Now using the digit 2,2,7 we have prime number 227 .Because other two numbers i.e. 722 and 272 are divisible by 2 and thus are not prime
Similarly 353 is prime number other two numbers 533 & 335 is not prime number

In case of 227, sum of the digits is 2+2+7 = 11.
And 2, 2, 7 all the digits are prime.

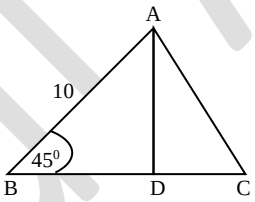
Similarly, In case of 353, sum of the digits is 3+5+3 = 11.
And 3, 5, 3 all the digits are prime.

Justify:
For 227,sum of the digits=2+2+7=11 and it has only two factors that are 1 & 227
For 353,sum of the digits=3+5+3=11 and it has only two factors that are 1 & 353
Answer: 227 & 353
Question-4:Solve: x/2 + 6/y = 9;x/3 + 2/y=5
Solution:
x/2 + 6/y=9----------(1)

x/3 + 2/y=5----------(2)

(ii) x 3 – (i)=»
=> x – x/2 =6
=> x/2 =6
=> x =12
From (i) => 12/2 + 6/y = 9
=> 6/y =3
Y = 2
Ans. (x, y) = (12, 2)
Question-5:The Length of each side of an isosceles triangle is 10 cm and the included angle between those two sides is 45 .Find the area of the triangle. [Rupali Bank Cash Officer(Cancelled)-2018]

We know that,
Sin 45°= perpendicular/hypotenuse
$1/\sqrt{2} = x/10$ Or,$x= 10/\sqrt{2}$
Then
Area of triangle = 1/2*b*h
$= 1/2*10*10/\sqrt{2}$
$=50/\sqrt{2}$
$=50*\sqrt{2}/\sqrt{2}*\sqrt{2}$(both side multiply root 2)
$=50*\sqrt{2}/2$
$=25\sqrt{2}$
Ans: $25\sqrt{2}$



6.A committee of 5 is to be formed from 6 male students and 5 female students.In how many ways can this be done so that the committee contains at least one male and one female students? [Rupali Bank Cash Officer(Cancelled)-2018]
Solution:
Given that,
At least one male and one female are included in the committee
So,There are 4 way to select the committee of following condition,

Way --------Male(6)----------Female(5)
01.---------- 6c1----------5c4------

02.---------- 6c2----------5c3------
03.---------- 6c3----------5c2------
04.---------- 6c4----------5c1-----

Way-1:6c1*5c4=5*6=30
Way-2:6c2*5c3=15*10=150
Way-3: 6c3*5c2=20*10=200
Way-4: 6c4*5c1=15*5=75
Total ways=455
Answer:455
Question-7:70 students are stydying physics mathematics and chemistry. 40 students study mathematics, 35 study physics and 30 students students chemistry.15 students are studying all the subjects. How many students are studying exactly two of the subjects? [Rupali Bank Cash Officer(Cancelled)-2018]
Solution:
Students that studying physics ,
Set P=35
Students that studying chemistry , Set C = 30
Students that studying maths
Set M = 40
Students are studying all the subjects,PnCnM=15
Let,
PnC + CnM + PnM=x
Total = P + C + M - (PnC + CnM + PnM) + (PnCnM) + Neither
Or,70=35+30+40- x + 15 + 0
Or,x=120-70
Or, x=50
Hence,PnC + CnM + PnM=50
So,Exactly studying two of the subjects=50-(15*3)=5
Answer:5

#***Alternative:***
Total=All single-(exactly two groups overlap)-{2*all three}+None
Or,70=40+35+30-(Exactly two groups overlap)-2*15+0
Or,70=75 -(Exactly two groups overlap)

Or, Exactly two groups=5

Answer:5

BDBL_SENIOR_OFFICER_2018

Question-1:The profit of a company is given in Taka by P = $3x^2$-35x+50, where x is the amount in Taka spent on advertising. For what values of x does the company make a profit?[BDBL_SENIOR_OFFICER_2018]

Solution:

Here,

$P=3x^2 - 35x + 50$

Now, if the company makes profit, then P>0

So,

$3x^2 - 35x + 50 > 0$

$=> 3x^2 - 30x – 5x + 50 > 0$

$=> 3x(x-10) – 5(x-10) > 0$

$=> (x-10)(3x-5) > 0$----------(1)

As this equation(1) is greater than 0,So the value of the two roots must have different values in different intervals.

Now,the equation(1),we have

x>10

Or, the value of x less than 5/3 and greater than or equal to 0

i.e . $0 \le x<5/3$,Because advertising cost can not be negative

So, the company makes a profit,the values of x={$0 \le x<5/3$ or ,x>10}

Answer: x={$0 \le x<5/3$ or ,x>10}

Question-2:An amount of Tk. 7200 is spent to cover the floor of a room by carpet.

An amount of Tk. 576 would be saved if the breadth were 3 meters less. What is the breadth of the room? [BDBL_SENIOR_OFFICER_2018]

সমাধান:

মনে করি, দৈর্ঘ্য x মি. , প্রস্থ y মি

প্রতি বর্গ মি খরচ হবে z টাকা
প্রশ্নমতে,
xyz=৭২০০--------(১)
xz(y-৩)=৭২০০-৫৭৬
=৬৬২৪-----(২)

সমীকরন(১) কে (২) নং দিয়ে ভাগ করে=>

xyz/xz(y-৩)=৭২০০/৬৬২৪

বা, y=৩৭.৫

উ: ৩৭.৫ মি

অথবা:
৫৭৬ টাকা কম খরচ হয় ৩ মিটার এ
১ টাকা কম খরচ হয় ৩÷৫৭৬
৭২০০ টাকা কম খরচ হয় (৩*৭২০০)÷৫৭৬ মিটার
=৩৭.৫ মিটার
উ: ৩৭.৫ মি

Question-3:Find the three digit prime number whose sum of the digits is 11 and each digit representing a prime number. Justify your answer. [BDBL_SENIOR_OFFICER_2018]
Solution:

Since the sum of the 3 digits is 11 and each digit represents a prime number,
So, the number less than 11 .
And the 3 digits may be 2,2,7 or 3,3,5
Because 2+2+7=11 and 3+3+5=11
Now using the digit 2,2,7 we have prime number 227 .Because other two numbers i.e. 722 and 272 are divisible by 2 and thus are not prime
Similarly 353 is prime number other two numbers 533 & 335 is not prime number

In case of 227, sum of the digits is 2+2+7 = 11.
And 2, 2, 7 all the digits are prime.

Similarly, In case of 353, sum of the digits is 3+5+3 = 11.
And 3, 5, 3 all the digits are prime.

Justify:

For 227,sum of the digits=2+2+7=11 and it has only two factors that are 1 & 227

For 353,sum of the digits=3+5+3=11 and it has only two factors that are 1 & 353
Answer: 227 & 353

Question-4: If a/(q-r) = b/(r-p)=c/(p-q) then show that, a+b+c = pa+qb+rc[BDBL_SENIOR_OFFICER_2018]

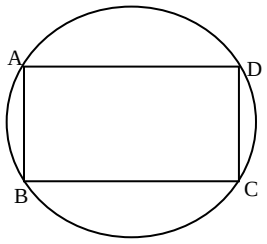
Solution:
Let,
a/(q-r) = b/(r-p) = c/(p-q) = k
So, a = k(q-r);
b = k(r-p);
and c = k(p-q)
Now,
L.H.S. =>
a+b+c = k(q-r)+ k(r-p)+ k(p-q)

= k(q-r+r-p+p-q)
= k x 0 = 0
And,
R.H.S. =>
pa+qb+rc = p*k(q-r)+ q*k(r-p)+ r*k(p-q)
= kpq-kpr+kqr-kpq+kpr-kqr
= 0
So, L.H.S. = R.H.S. **(Showed)**

Question-5:Prove that a cyclic parallelogram must be a rectangle.
[BDBL_SENIOR_OFFICER_2018]
Solution:

Let,

ABCD be the cyclic parallelogram
Prove that, ABCD is a rectangle
Since ABCD is a parallelogram
<A = <C -------(1)
And, <A+<C = 180°
since A = C
So, <A+<A = 180°
Or, 2<A = 180°
Or, <A = 90°
if any one angle of parallelogram is 90°, the parallelogram is a rectangle.



Question-6:After traveling 108 km, a cyclist observed that he would have required 3 hrs less if he could have traveled at a speed 3 km/hr more. At what speed did he travel? [BDBL_SENIOR_OFFICER_2018]
Solution:
Let,
The speed be x km/hr
According to the question,
(108/x)-{108/(x+3)}=3
Or,(x-9)(x+12)=0
So,

x=9
x=-12[It is not acceptable] **Answer:** 9 km/hr

Question-7:Solve: x/2 + 6/y = 9;x/3 + 2/y=4[BDBL_SENIOR_OFFICER_2018]
Solution:
x/2 + 6/y=9----------(1)
x/3 + 2/y=4----------(2)

(ii) x 3 – (i)=»
=> x – x/2 = 3
=> x/2 = 3
=> x = 6
From (i) => 6/2 + 6/y = 9
=> 6/y = 6
Y = 1
Ans. (x, y) =(6, 1)

BKB CASH OFFICER-2018

Question-1:The sum of three numbers in an Arithmetic Progression is 30. The sum of their squares is 318. Find the numbers. [BKB_CASH_OFFICER_2018]

Solution:
Let ,
The 2nd term is a
and common difference is d
So ,
1st term be =a-d
2nd term be=a
3rd term be =a+d
According to the question,
a-d+a+a+d=30
=» 3a=30
=» a=10
So,we can write,
2nd term is 10
1st term=10-d
and
3rd term=10+d
Again,
$(10-d)^2+10^2+(10+d)^2=318$
=»$100-20d+d^2+100+100+20d+d^2=318$
=»d=3
So,

1st term=10-3=7 2nd term=10 and 3rd term=10+3=13
answer: 7, 10,13

Question-2:Among 50 people, 35 can speak English , 25 can both English and Bangla, and each can speak at least one of the two language . how many speak only bangla?
[BKB_CASH_OFFICER_2018]

Solution:
Given that,
Total people=50
Speak English=35
Speak both Bangla & English=25
Only English speak =(35-25)=10
Bangla speak =(50-10)=40
Only Bangla speak(40-25)=15
Answer:15

Alternative:
Total=All single -Both+none
Or,50=35+B-25+0
or, B=40
So total 40 speak bangla.
speak only bangla=40-25=15
Answer:15

Question-3: $64x^3 -9ax^2+108x-b$. what is the value of a and b for making it perfect cube.[BKB_CASH_OFFICER_2018]

Solution:
Given that,
$64x^3 -9ax^2+108x-$ q^3
We know the formula for perfect cube
$(p-q)^3=p^3-3.p^2.q+3.p.q^2-q^3$
Comparing with given Equation,

$p^3 =64\ x^3$

$P=(4x)^3$……..(1)

Again,

$3p^2q =9ax^2$**……..(2)**

$3pq^2$ **$=108x$……..(3)**

$q^3 =$ b…..(4)

From (3) we get,

$3pq^2 =108x =3.4x,3^2$

So, q =3

From (4)=>

$b=3^3$

b = 27

From (2)=>

$3p^2q = 9ax^2$

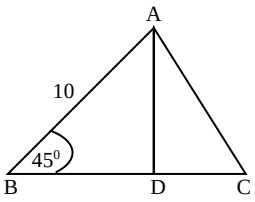
Or,$9ax^2$ **$3.(4x)^2.3=$**$9ax^2$

Or,144x2=$9ax^2$

Or,a=16 So a=16 and b=27 **Answer:** 16 and 27

Question-4:The Length of each side of an isosceles triangle is 10 cm and the included angle between those two sides is 45 .Find the area of the triangle.[BKB_CASH_OFFICER_2018]

Solution:



We know that,
Sin 45°= perpendicular/hypotenuse
$1/\frac{1}{}\sqrt{2} = x/10$

$x= 10/\sqrt{2}$

Then
Area of triangle = 1/2*b*h
$= 1/2*10*10/\sqrt{2}$
$=50/\sqrt{2}$
$=50*\sqrt{2}/\sqrt{2}*\sqrt{2}$(both side multiply root 2)
$=50*\sqrt{2}/2$
$=25\sqrt{2}$
Ans: $25\sqrt{2}$

Question-5: Price of 3 tables and 5 chairs is 2000 tk. Price of 5 table and 7 chairs is 3200 tk. What is the price of 1 table and 1 chair? [BKB_CASH_OFFICER_2018]

Solution:
Let,
Cost price of 1 table be x
And
Cost price of 1 chair be y
3x+5y =2000……..(i)
5x+7y =3200…….....(ii)

(i)*5 -(ii)*3=»
15x+25y=10000
15x+21y=9600
……
Or,o 4y=400
or,y=100 tk

So,
3x+5*100=2000
Or 3x=2000-500
or 3x=1500
or x=500

Answer: The cost of 1 table is tk 500 and 1 chair is 100 tk and total 600 tk

Question-6:A committee consist of 3 members. If there are 7 men and 5 women available to serve on the committee. How many different committee can be formed? [BKB_CASH_OFFICER_2018]

Solution:
Total committee member should be selected =3
men=7 and women=5

so the combintions can be:
(I) 7c3*5c0=35
(Ii) 7c2*5c1=21*5=105
(Iii)7c1*5c2=7*10=70
(Iv)7c0*5c3=1*10=10
so total no of committe will be=35+105+70+10=220
Answer:220

Question-7:A and B started a business with the capital 3000 and 4000 tk. After 8 months, A invested tk 2500 more in the business and 7 months after, total profit 980 tk. Find the share of each.[BKB_CASH_OFFICER_2018]

Solution:
Total business duration (8+7)=15 months.

So, A's time equivalent investment of 1 month
={3000*8+(3000+2500)*7=24000+38500}
=62500 tk
And
B's investment=4000*15=60000 tk
Now,their investment ratio A: B
=62500:60000
=25:24
Since,
A get profit=980*25/49=500 tk
and B get profit=980*24/49=480 tk
Answer: 500 and 480 tk

Question-8:Resolve into factors: a^2**+1/**a^2**+2-2a-2/a[**BKB_CASH_OFFICER_2018]

Solution:

$a^2+1/ a^2+2-2a-2/a$

$=(a+1/a)^2-2a.1/a+2-2(a+1/a)$

$=(a+1/a)^2-2+2-2(a+1/a)$

$=(a+1/a)^2-2(a+1/a)$

$=(a+1/a)(a+1/a-2)$

Answer: $(a+1/a)(a+1/a-2)$

ABL SO(Auditor)-2018

Question-1:In a survey at an airport,55 said that last year they had been to Spain,53 to France and 79 to Germany,18 had been to Spain and France ,17 to Spain and Germany,and 25 to France and Germany while 10 had to all three countries.How many travelers took part in the Survey?[Agrani Bank SO (Auditor) Written-2018]

Solution:

Let ,

The Number of people who travelled to Spain=n(A)

The Number of people who travelled to France=n(B)

And

The Number of people who travelled to Germany=n(C)

Given that,

n(A)=55

n(B)=53

n(C)=79

$n(A\cap B) = 18$

$n(A\cap C)=17$

$n(B\cap C)=25$

and

$n(A\cap B\cap C)=10$

We know that

$n(U)= n(A)+ n(B)+n(C)-n(A\cap B) - n(A\cap C)-n(B\cap C)+n(A\cap B\cap C)$

Or,n(U)=55+53+79-18-17-25+10

Or,n(U)=137

Hence, 137 members took part in the survey

Answer:137

Short cut:
Total=S+F+G-sum of two group overlap+all three+none
Total=55+53+79-18-17-25+10
=137
Answer: 137

Question-2:A shopkeeper sells two shirt at the same price.He makes 10% profit on one and losses 10% on the other.How much percentage does he gain or lose? [Agrani Bank SO (Auditor) Written-2018]
Solution :

Let,
Selling price of first & Second shirt be =tk 100
First case,
10% profit on CP
SO,
CP + CP Of 10%=100
Or, CP=1000/11
Second case,
10% loss on CP
CP - CP of 10%=100
Or, CP =1000/9
Total Cost price=(1000/11)+(1000/9)
=202.02 tk
Total Selling price=(100+100)=200 tk
Loss=CP-SP=202.2-200=2.02
Loss percentage
=(2.02*100)/202.02
=1%

Alternative for MCQ:
By applying effective rate:
=10-10-(10*10/100)
=1% loss

Another Alternative:
In the case where loss and gain percentage is common on same selling price, always a loss incurs in total deal. And this can be calculated by a short-cut:

Loss on total deal,
= (Common loss or gain percentage /10)2= (10/10)2
= 1%

Question-3:Find the HCF of
x^3 - 16x, 2 x^3 + 9 x^2+ 4x ,
2 x^3+ x^2 - 28x

Solution:

First case,
x^3-16x
=x(x^2-16)
=x(x-4)(x+4)

Second case,
2 x^3+9 x^2+9x
=x(2 x^2+9x+4)
=x(x+4)(2x+1)

3rd case,
(2 x^3)- x^2-28x
=x(2x^2 - x +28)
=x(x+4)(2x-7)

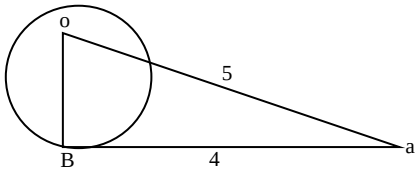
Hence, HFC of these factors
=x(x+4)

Answer: x(x+4)

Question-4:The length of a tangent(স্পর্শক)from a point A at distance 5 cm from the centre of the circle is 4 cm.Find the radius of the circle. [Agrani Bank SO (Auditor) - 2018]

Solution:

Let,
Radius of the circle be=r
r^2=(5^2)-(4^2)
Or, r^2=9
Or, r=3
So, Radius of circle be 3 cm **[Answer]**



Question-5 : Simplify: (5x+2)/(x^2**-x-20)+(2x-1)/(** x^2**-4x-5)[Agrani Bank SO (Auditor) Written-2018**

Answer : ($7x^2$+14x-2)/(x-5)(x+4)(x+1)

BHBFC SO-2017

1:Twice the width of a rectangle is 10 meters more than its length. If the area of the region enclosed by the rectangle is 600 square meters then find its perimeter.[BHBFC SO_2017]

Solution:
Let,
Width of rectangle is x m
And
Length of the rectangle is 2x-10 m
According to the question,
x*(2x-10)=600
or, x^2-5x-300=0
or, (x-20)(x+15)=0

Here, x=20
Either
x=-15 [it's not acceptable]
So,the width of rectangle is 20 m
Length=(20*2-10)=30 m

Perimeter of the rectangle is =2(30+20)
=100 m
Ans:100 m

2:A boat running upstream takes 8 hours 48 minutes to cover a certain distance, while it takes 4 hours to cover the same distance running downstream. What is the ratio between the speed of the boat and speed of the water current respectively?[BHBFC_SO_2017]

Solution :
Let,
Speed of the boat is x
Speed of the current is y
Speed of the downstream=(x+y)
Speed of the upstream=(x-y)

According to the question,
{8.8(x-y)}={4(x+y)}
or, 8.8x-8.8y=4x+4y
or, 4.8x=12.8y
or, 24x=64y
or, x:y=8:3
And:8:3

3:A customer bought 5 pencils and 6 erasers at tk. 80. Next week, the price of each pencil increases by 20% but the price of erasers remains unchanged. Now the customer buys 2 pencils and 3 erasers at tk. 39. Find the new price of each pencil. [BHBFC_SO_2017]
:::
Solution:
Let,
Price of each pencil be P
Price of each eraser be E
New price of each pencil
=P*6/5
=6P/5
So,price of 2 pencil
=2*6P/5
=2.4P
According to the question,
5P+6E=80----------(i)
2.4P+3E=39---------(ii)
(i)-(ii)*2
5P+6E=80
4.8P+6E=78

0.2P=2
Or,P=2/0.2
=10
So,the new price of the pencil
10*6/5=12
Ans:12 tk

4:A, B and C can complete a work in 12, 15 and 25 days respectively. A and B started working together whereas C worked with them in every third day. Find the number of days required to complete the work. [BHBFC_SO_2017]
Solution:
A and B together can complete in 1 day
= 1/12 + 1/15 = 9/60 = 3/20 of the work.

A and B with the help of C can complete in 1 day
=(3/20 + 1/25) part of the work
= 19/100 part of the work.
So, their 3 days' work
= 2×3/20 + 19/100
= (30+19)/100
= 49/100 of the work.
So, their 3×2 = 6 days' work
= 49×2/100
= 49/50 of the work.
Remaining work
=1 - 49/50
= 1/50 of the work.
on the 7th day,
A and B will take 1/15 portion work
={20/50*3}=0.133 day's

Therefore, the required number of days
=(6 +.133)=6.133 days.
Answer: 6.133 days.

5:The price of a shirt and a pant together is Tk. 1300. If the price of the shirt increases by 5% and that of the pant by 10%, it costs Tk. 1405 to buy those two things. Find the respective price of a shirt and a pant. [BHBFC_SO_2017]
:::
Solution:
Suppose,
The prices of a shirt and a pant are Tk. x and Tk. y respectively. According to the question:
x+y = 1300 ---------- (i)
1.05x + 1.1y = 1405 ---------- (ii)
Subtracting from
(i)*1.1 - (ii)=»
0.05x =25
Or, x = 500
Substituting the value of x in equation (i) we get,
500+y = 1300 y = 800.

Answer: Shirt Tk. 500, Pant Tk. 800.

Question-6: 3 coins are tossed at random. Show the sample space and find the probability of getting: - (i) one head two tails
(ii) One tail
(iii) One tail and two heads
Solution:
::::
Total Sample Space after tossed 3 coins randomly

=HHH, HHT, HTH, THH, HTT, THT, TTH, TTT
Probability of getting one head and two tails: In the sample space we can see, a total of 8 types of outcome is possible.
Among these 8 types of outcomes, the combinations with one head and two tails are ---- HTT, THT, TTH,
3 outcomes.
So, the required probability is
3/8

(ii) Probability of getting one tail:
Above the sample space we can see that, a total of 8 types of outcome is possible.
Among these 8 types of outcomes, the combinations with one tail are -- HHT, HTH, THH,
3 outcomes.
So, the required probability is 3/8

(iii) Probability of getting one tail and two heads:Above the sample space we can see that, a total of 8 types of outcome is possible. Among these 8 types of outcomes, the combinations with one tail and two heads are : HHT, HTH, THH, i.e: 3 outcomes. So, the required probability is 3/8.

Answer:
Total Sample Space = {HHH, HHT, HTH, THH, HTT, THT, TTH, TTT),
(i) 3/8, (ii) 3/8, (iii) 3/8.

❖Rupali Bank Officer Cash-2018

Question-1:In a survey at an airport,55 said that last year they had been to India,53 to Napal and 79 to Bhutan,18 had been to India and Nepal ,17 to India and Bhutan and 25 to Nepal and Bhutan,while 10 had to all three countries.How many travelers took part in the Survey?[Rupali Bank Cash-2018]
Solution:
Let ,
The Number of people who travelled to India=n(A)
The Number of people who travelled to Nepal=n(B)
And
The Number of people who travelled to Bhutan=n(C)
Given that,
n(A)=55
n(B)=53
n(C)=79
n(A∩B) = 18
n(A∩C)=17
n(B∩C)=25
and
n(A∩B∩C)=10

We know that
n(U)=n(A)+n(B)+n(C)-n(A∩B)-n(A∩C)-n(B∩C)+n(A∩B∩C)
Or,n(U)=55+53+79-18-17-25+10
Or,n(U)=137
Hence, 137 members took part in the survey
Answer:137

Alternative:

Total=S+F+G-sum of two group overlap+all three+none
Total=55+53+79-18-17-25+10=137
Question-2: Price of 3 tables and 5 chairs is 2000 tk. Price of 5 table and 7 chairs is 3200 tk. What is the price of 1 table and 1 chair? [BKB_CASH_OFFICER_2018] [Rupali Bank Cash-2018]
Solution:
Let,
Cost price of 1 table be x
And
Cost price of 1 chair be y
3x+5y =2000……(i)
5x+7y =3200……(ii)
(i)*5 -(ii)*3=»
15x+25y=10000
15x+21y=9600
……
Or,o 4y=400
or,y=100 tk
So,
3x+5*100=2000
Or 3x=2000-500
or 3x=1500
or x=500
Answer: The cost of 1 table is tk 500 and 1 chair is 100 tk and total 600 tk

Question-3:A shopkeeper sells two shirt at the same price.He makes 10% profit on one and losses 10% on the other.How much percentage does he gain or lose?
[Agrani Bank SO (Auditor) -2018] [Rupali Bank Cash-2018]
Solution :
Let,
Selling price of first & Second shirt be =tk 100
First case,
10% profit on CP
SO,

CP + CP Of 10%=100
Or, CP=1000/11
Second case,
10% loss on CP
CP - CP of 10%=100
Or, CP =1000/9
Total Cost price=(1000/11)+(1000/9)
=202.02 tk
Total Selling price=(100+100)=200 tk
Loss=CP-SP=202.2-200=2.02
Loss percentage
=(2.02*100)/202.02
=1%
Alternative for MCQ:
By applying effective rate:
=10-10-(10*10/100)
=1% loss

Another Alternative:
In the case where loss and gain percentage is common on same selling price, always a loss incurs in total deal. And this can be calculated by a short-cut:
Loss on total deal,
= (Common loss or gain percentage /10)2= (10/10)2
= 1%

Question-4:If $a=xy^{p-1}$, $b=xy^{p-1}$, $c=xy^{p-1}$, Then compute a^{p-r}, b^{r-p}, c^{p-q}[Agrani Bank Cash Officer-2018] [Rupali Bank Cash-2018]
Solution:

Hence: $a=xy^{p-1}$

$$a^{(q-r)} = \{xy^{(p-1)}\}^{(q-r)}$$

$\therefore \quad a^{(q-r)} = x^{(p-1)} \quad xy^{(p-1)(q-r)}$

and $b = xy^{p-1}$

$$b^{(r-p)} = \{xy^{(p-1)}\}^{(r-p)}$$

$\therefore \quad b^{(r-p)} = x^{(r-p)} \quad xy^{(q-1)(r-p)}$

and $c = xy^{r-1}$

$$c^{(p-q)} = \{xy^{(r-1)}\}^{(p-q)}$$

$\therefore \quad c^{(p-q)} = x^{(p-q)} \; xy^{(r-1)(p-q)}$

$a^{(q-r)},\ b^{(r-p)}\ , c^{(p-q)}$[মান বসিয়ে পাই]

So, $= a^{(q-r)},\ b^{(r-p)}\ , c^{(p-q)}$

$= x^{(q-r)} \times\ y^{(p-1)\ (q-r)}\ \times x^{(r-p)} \times y^{(q-1)\ (r-p)}\ \times x^{(p-q)}\ \times y^{(r-1)(p-q)}$

$= \{x^{(q-r)},\ x^{(r-p)}, x^{(p-q)},\} \times \{y^{(p-1)\ (q-r)}\ \times y^{(q-1)(r-p)}\ \times y^{(r-1)(p-q)}\}$

$= x^{0} \times y^{pq-pr-q+r+qr-pq-r+p+pr-qr-p+q}$

$= x^{0} \times y^{0}$

$= x \times y=1$

Answer:1

Question-5:A family has 480 kg of rice for X number of weeks.If they need to use the same amount for 4 more weeks, they need to cut down their weekly assumption of rice by 4 kg. what is the value of X? [Rupali Bank Officer Cash-2018]

Solution:

Family"s previous Consumption by week = 480/x

Latest Consumption by week = 480/(x+4)
According to the question,
Or, 480/x - 480/(x+4) = 4
Or, 4x (x+4) = 480*4
Or, x (x+4) = 480
Or, x^2 + 4x - 480 = 0
Or, (x-20) (x+24) = 0

OR,

x-20=0

Or, x=20

Either, x = -24
Ans : 20 weeks

Question-6:If cos (A+B) = 1/√2 and Cos (A-B) = √3/2, then what is the value of A & B. [Rupali Bank Officer Cash-2018]
[0∘ < A+B ≤ 90∘ And A > B]

Solution:
Given that,

cos (A+B) = 1/√2

Or, Cos (A+B)= Cos 45 [Since, Cos 45 = 1/√2]
Or, A+B = 45
A = 45 - B ……..(1)

Again,
Cos 30 = √3/2 = Cos (A-B)
Or, A-B = 30
Or, 45-B -B = 30 [From Equation (1)]
Or, B = 15/2

Putting the value of B= 15/2 in Equation (1)

So, A = 45 - 15/2 = 75/2

Ans : 75/2 & 15/2

Question-7:Solve: 1/2x + 6/y = 3, 5/x + 3/y = 11[Rupali Bank Cash-2018]
Solution:

Given That,

1/2x + 6/y = 3
12x + y = 6xy
y = 6xy - 12x
5y = 30xy - 60x ----------(1)

Again, given that--

5/x + 3/y = 11
3x + 5y = 11xy
3x + 30xy - 60x = 11xy [From equation-1}
57x = 19xy
y = 3

Putting the valu of y=3 in equation-1

So,
3 = 6*x*3 - 12x
18x - 12x = 3
x = 3/6 = ½

Ans (x,y) = (1/2, 3)

Ahsanullah University of Science & Technology

PKB SEO -2018

Question-1: In a flight of 600 km ,an aircraft was slowed down due to bad weather.Its average speed for the trip was reduced by 200 km/hr and the time of flight increaseby30 minutes.The duration of the flight is. **[PKB SEO -2018]**

[Rupali Bank Written-2013]
Solution:
Let,
The duration of the flight be=x hrs
Original distance be=600 km
According to the question,
Original speed-Reduced speed=200
600/x-600/(x+1/2)=200
Or,600/x-1200/(2x+1)=200
Or,3/x-{6/(2x+1)}=1
Or,(6x+3-6x)/{x(2x+1)}=1
Or,$2x^2$+3x-2x-3=0
Or,x(2x+3)-1(2x-3)=0
Or,(2x+3)(x-1)=0
Now,
X-1=0
Or,X=1
And
2x+3=0
Or,X=-(3/2)
[neglecting the negative value]
Answer:1 hour

Alternative:

Let,
Original time be= t hrs
Original speed be=S km/hrs
Here,Distance (D)=600 km
According to the first condition,
D=st
Or,s=D/t
Or,s=600/t=======(1)
According to the 2nd condition,
600=(s-200)*(1/2+t)
{(Putting value s=600/t) 2nd condition}
Or,(2t+3)(t-1)=0
Now,
2t+3=0
Or,t=-(3/2)
[neglecting Negative value]
And
t-1=0
Or,t=1
So Duration of the flight 1 hour
Answer:1 hour

Question-2:A alone can reap a certain field in 15 days and B in 12 days .If A begins alone and after a certain interval B joins him,the field is reaped in 7.5 days .How long did A and B work together. **[PKB SEO -2018]**
Solution:
Suppose,
'x' be the number of days that A and B worked together
And
Total work be 1 portion
A's 1 day's work =1/15

B'S 1 day's work = 1/12

According to the question,
(7.5-x)/15 + x(1/15 + 1/12) = 1
=»(7.5-x)/15 + 9x/60 = 1
=»(30-4x+9x)/60=1
=»30 + 5x = 60
=»x = 6

Hence, A & B work together 6 days
Answer:6 days

Question-3:a, b, c, d, e are 5 consecutive numbers in increasing order, deleting one of them from the set decreased the sum of the remaining numbers by 20% of the sum of 5. Which one of the number is deleted from the set? **[PKB SEO -2018]**
[Bangladesh Bank AD-2014]
[Bangladesh Bank AD-2012]
[PBL SO-2013]
Solution-1:====
Since a,b,C,d,e are increasing order consecutive number
b=a+1
c=a+2
d=a+3
e=a+4
The sum of five numbers
=a+a+1+a+2+a+3+a+4
=5a +10
Now we are given that the sum decreased by 20% when one number was deleted
Hence,
The new sum should be
=(5a+10)-20% of(5a+10)
=4a+8
Now,
New sum
=old sum- Dropped number
4a+8=5a+10-Dropped number
Dropped number=a+2=C
Answer:C
Solutions-2:====
Let, the consecutive numbers are,
a =1
b = 1 + 1 = 2
c = 1 + 2 = 3
d = 1 + 3 = 4
e = 1 + 4 = 5
So, Total = 1 + 2 + 3 + 4 + 5 = 15
Deleting one of the five numbers from the set then decreased 20% of the sum.
20% of the sum
=(15 x 20)/100
=3
So, the deleted number is the 3rd as c from the set
Answer :C
Solution-3:=====
Let,
C=x. b=x-1. a=x-2
d=x+1

e=x+2
Sum=x-2+x-1+x+x+1+x+2
=5x
Suppose,
The deleted number was=p
According to the question,
P=20% of 5x
P=x
Answer:C

Question-4:A tank can be filled by a tap in 20 minutes and by another tap in 60 minutes. Both the taps are kept open for 10 minutes and then the first tap is shut off. After this, the tank will be completely filled in what time ? **[PKB SEO -2018]**

Solution:
Work done by both in 1 minute
= (1/20 + 1/60) = 4/60=1/15

Work done by both in 10 minute
=10/15=2/3 portion
Remaining part
=(1 - 2/3)
= 1/3 portion

Now, 1/60 part is filled in 1 minute.
So, 1/3 part will be filled in 20 minute.

Answer:20 min

Bank Assistant Manager-2018

Q-1.There was a shipment of cars. Out of which half was black in colour. Remaining cars were equally blue, white and red. 70% of black cars, 80% of blue cars, 30% of white cars, 40% of red cars were sold. What percentage of total cars were sold?Basic [Bank Assistant Manager-2018]
Solution:
Suppose,
The total car was x
From question
Black was = x/2
Remaining cars =(x-x/2)=x/2
According to the question,
Other cars are equal colours
So,
Blue,White, and Red are
x/6,x/6,x/6 respectively

Sold cars:
Black cars=x/2 of 70%=7x/20
Blue cars=x/6 of 80%=2x/15
White cars=x/6 of 30%=x/20
Red cars=x/6 of 40%=x/15
Total sold
=(7x/20)+(2x/15)+(x/20)+(x/15)
=180x/300
Required percentage
=(180x*100)/(300*x)
=60%
Answer:60%

Q-2. A train passes a man in 3 second, and another train from opposite direction pass the man 4 second, both train same length. how long time need to pass the train each other? [Bank Assistant Manager-2018]
Solution:
Let,
Both train length be x
So,
Total length of two train=(x+x)=2x
Speed Of First train = x/3
Speed Of second train =x/4
We know that,
Time=Distance/speed
Or,T = 2x/(x/3 + x/4)
Or,T= 2x*12/7x
Or, T=24/7

Hence, 3.42 second need to pass each other
Answer:3.42 seconds

Q-3.Working together pipe P, Q and T can fill a trunk in 5 hours. Working together P and Q can fill it in 7 hours. Find in how many hours T can fill it?[Bank Assistant Manager-2018]
Solution:
Total work = 35 unit
[LCM of 7 ,5=35]
Together work:
(P+Q)= 35/5=7 unit/hrs
(P+Q+T)= 35/7=5 unit/hrs
Working capacity of T
T=7-5=2 unit/hrs
So,we can say that,
T 2 unit done in 1 hr
35 units done in 35/2 = 17.5 hrs
Answer:17.5 hrs

Q-4.If a person invest 4000 taka at x% and 5000 taka at y%, he will get total 320 taka as interest. On the other hand if he invest 5000 at x% and 4000 at y%, he will get total 310 taka as interest. Find the value of x and y.
[Bank Assistant Manager-2018]
Solution:
According to the question,
{4000*x/100}+{5000*y/100}=320
Or, 4x + 5y = 32 ----------(i)
Again,
{5000*x/100}+{4000*y/100}= 310
Or,5x + 4y = 31----------(ii)

(i)*5 &(ii)*4=»
20x + 25y = 160
20x + 16y = 124

Or,9y = 36
Or,y = 4
From equation(I)
4x + 5y = 32
x = (32-5*4)/4 = 3
Answer:(3,4)

Q-5.A box contains 5 green, 4 yellow and 3 white marbles.Three marbles are drawn at random. What is the probability that all they are not of the same colour?[Bank Assistant Manager-2018]
Solution:
Here
Green=5
Yellow=4
White=3
So,Total =(5+4+3)=12
No of ways of drawing 3 marbles out of 12 = ${}^{12}c_3$ = 220
event of getting 3 marbles of same color = ${}^{5}c_3$ + ${}^{4}c_3$ + ${}^{3}c_3$=10+4+1= 15
probability of getting 3 marbles of same color =15/220 = 3/44
the probability that not getting marbles of same colour
=(1-3/44)=41/44
Answer: 41/44

Q-6. A man works for certain hours. If his hourly payment increase by 20%, what percent of working hours he may reduce so that total income remain unchanged?[Bank Assistant Manager-2018]
Suppose,
hourly pament=100tk
After increased 20% then new payment
=(100+20)=120tk
So,

TK 20 reduced from tk 120
Tk 100::::::::::::::::::::::={20*100/120}
={100/6}
=16.67%
Answer:16.67%

Q-7:There were some books of novel and non fiction. Board discuss 3 times for any nobel and 5 times for any non fiction. During a year they discuss total 52 times. If there were 12 books. How many of them were novel? [Bank Assistant Manager-2018]
Suppose,
Novel books be x
Non Fiction books be(12-x)
According to the question,
3x+5(12-x)=52
Or,3x+60-5x=52
Or -2x=-8
Or,x=4.

So,Nobel books were 4
Answer:4

Sonali Bank AE(IT)-2016

1.A,B and C enter into partnership with investment in the ratio 5:7:8. if at the end of the year A's share of profit is 42360. how much is the total profit?[Sonali Bank AE(IT)-2016]
Solution:
Let,
A' investment is 5x tk
B investment is 7x tk
C investment is 8x tk
Total investment=5x+7x+8x=20xtk
So,
5x = 42360
Or, x = 8472
Now, total investment=20*8472= 169440 tk
Answer:1,69,440 TK

2.Two-third of the faculty members of a department are female. Twelve of the male teachers are unmarried, while 60% of them are married.The total number of faculty members in the department is:[Sonali Bank AE(IT)-2016]
Solution:
Let, total members be x, then female members be 2x/3
So, male members be = x - 2x/3 = x/3
According to the question,
12 teachers are unmarried

Or,(100-60=) 40% =12
So, 100% = 12*100/40 = 30
Again,
x/3 = 30
Or, x=90
Now,total faculty members are 90
Answer:90

3.A trader marked the price of the T.V. 30% above the cost price of the T.V. and gave the purchaser 10% discount on the marked price, thereby gaining Rs.340. Find the cost price of the T.V ?[Sonali Bank AE(IT)-2016]
Solution:
Let, cost price of tv is x tk
Then, the market price = x + x*30/100 = 13x/10 tk
At 10% discount on market price,
Selling price = 13x/10 - 13x*10/10*100 = 117x/100 tk
Profit = 117x/100 - x = 17x/100 tk
According to the question,
17x/100 = 340
=>x = 340*100/17
=> x = 2000
So, the cost price of the TV is 2000 tk
Answer:2000 tk

4. A circular wheel 28 inches in diameter rotates (moves) the same number of inches per second as a circular wheel 35 inches in diameter.If the smaller wheel makes x revolutions per second,how many revolutions per minute does the larger wheel make in terms of x ? [Sonali Bank AE(IT)-2016]
Solution:
As we know,
1 revolution of circle= Circumference of that circle.
Again,
Circumference of circle=2πr
Given that,
Diameter = 28 inches
So, radius, r= 28/2= 14 inches
Now, circumference = 28π inches
Hence,
x revolutions per sec = 28πx inches
Then in 60 sec 28πx*60 inches
According to the question,
28πx*60 = 35πn
=> n = 48x

Thus, the required no of revolutions is 48x
Answer:48x

❖JBL EO -CIVIL-2017

1.The price of a balcony seat in a theater is 1/3 of the price of a seat in the orchestra. When the theater is completely sold out, the total receipts from the 600 orchestra seats and the 450 balcony seats are Tk. 4500. What is the price of the orchestra seat?
[JBL EO -CIVIL-2017]
Solution:
Let,
Orchestra seat price = x tk
balchony seat price = x/3 tk
According to the question,
600x+ 450*x/3=4500
=> 600x+150x = 4500
=> 750x = 4500
=> x = 6 tk
Answer: 6 tk

2.A lamp is manufactured to sell for Tk. 35, which yields a profit of 25% of cost. If the profit is to be reduced to 15% of cost, what will be the retail price of the lamp?
[JBL EO -ELECTRICAL-2017]
Solution:
Let,
Cost price of the lamp is 100 tk
Sp 125 tk then cp 100 tk
:
Sp 35 " (100*35)/125=28
15% profit on cost price then retail price
=(28+28*.15)
=32.20 tk
Answer: 32.20 tk

3.In june a baseball team that played 60 games had won 30% of its game played.After a phenomenal winning streak this team raised its average to 50% .How many games must the team have won in a row to attain this average?

[JBL EO(Engineer)Electrical MCQ -2017]
Solution:
Given that,
Total game played=60
Won =30%
Total game won= 60*30/100 i.e. 18
Now The team plays x games and win all of those to increase the
average to 50%.
So,
(60+x)*50/100=18+x
Or,(60+x)/2=18+x
Or,60+x=36+2x
Or,24=x
Answer: 24.

4.A dozen eggs and 10 pounds of apples are currently at the same price. If the price of a dozen eggs rises by 10 percent and the price of apples rises by 2 %.How much more will it cost to buy a dozen eggs and 10 pounds of apples?
[JBL EO(Engineer)Electrical MCQ -2017]
[Premier Bank-2003][Dhaka Bank-2004][SIBL-2004][SEBL-2005][Titas Gas-2011]
Solution:
Suppose,
1 dozen eggs and 1 dozen apples price be 100 tk
10% increase eggs price now,
=100 of 10%=110 TK
2% increase apples price now,
=100 of 2%=102 tk
Now total price both apples and eggs=(110+102)=212 tk
Previous price both apples and eggs=100+100=200 TK
Percentage increase
={(212-200)*100}/200
=6%
Answer:6%
Answer:For MCQ
দুটি জিনিসের দাম যদি সমান হয়।
তবে, % Cost=(F+S)/2
So,
Cost=(10+2)/2=6
Answer :6

5.Equal amount of water were poured into two empty jars of different capacities, which made one jar 1/4 full and other jar 1/3 full. If the water in the jar with lesser capacity is then poured into the jar with greater capacity, what fraction of the larger jar will be filled with water?
[JBL EO(Engineer)Electrica MCQ -2017]
Solution:Written Approach

LCM of 4 & 3 =12
Suppose,
Each jar water poured=12
So,Large jar capacity
1/4 portion=12
Or, Full portion=12*4=48

If the water in the jar with lesser capacity is poured into the jar with greater capacity ,Then the greater capacity contains=(12+12)=24 Required fraction=24/48=1/2 Answer:1/2

Basic Bank- (AM)-2018 Preliminary

Q-1:A milkman purchases the milk at Tk. x per liter and sells it at Tk. 2x per liter still be mixes 2 liters water with every 6 liters of pure milk.What is the profit percentage? [Basic Bank- (AM)-2018 Preliminary]
Solution:
Given that,
Cost price of 6 litre milk= 6x tk
When sells 6 liters milk then mix 2 liters water.
So he total sell = 6+2 = 8 liters.
Selling price of 8 litre milk
= 8*2x = 16x tk
Total profit = 16x-6x = 10x tk
Profit percentage=
(10x ×100)/6x = 166.66%

Answer:166.66%

Q-2:A man could buy a certain number of notebooks for Tk. 300. If each notebook cost is Tk.5 more, he could have bought10 notebooks less for the same amount. Find the price of each notebook?
[Basic Bank- (AM)-2018 Preliminary]
Solution:
Let
Price of each notebook=x tk
According to the question,
(300/x)-{300/(x+5)}=10
Or,x^2+ 5x =150
Or,(x+15)(x-10)=0
Or,x =10

Answer:10

Q-3:4 men and 6 women can complete a work in 8 days, while 3 men and 7 women can complete it in 10 days.In how many days will 10 Women complete it

[Basic Bank- (AM)-2018 Preliminary]
Solution:
According to the question,
(4men+6 women)×8
=(3men+7women)×10
∴32men+48women=30men+70 women
or,2men=22women
So, 1 man =11 women
Now,
4men + 6 women = 44women + 6 women = 50
50 women need to complete full work 8 days
So, 1:::::::::::::::::::::::::::: = 50×8 days
and 10 ::::::::::::::::::::::::::={(50×8)/10}
= 40 days.

Alternative solution:
Let,
1 Man's 1 day's work=x
1 Woman's 1 day's work=y
According to the question,
4x+6y=1/8 ----------(I)
3x+7y=1/10 ----------(II)
3*I & 4*II=»
12x+18y=3/8----------(III)
and
12x+28y=4/10----------(IV)
Subtracting III from IV, we get,
10y=4/10-3/8
=>10y=16-15/40
=>10y=1/40
So, 10 woman's 1 day's work=10y=1/40
So, 10 Women can do the work in 40 days(Answer)
Answer:40 days

Q-4: A water tank has tow taps (Tap –1 and tap-2). Tap -1 can fill a tank in 8 hrs and Tap -2 can empty the in 16 hrs. How long will they take to fill the tank if both taps are opened simultaneously but tap-2 is closed after 8 hrs?
[Basic Bank- (AM)-2018 Preliminary]
Solution:
In 8 hrs filled in 8(1/8-1/16)
=1/2 part
Remaining=1-1/2=1/2 part

1/8 part done by A in 1 hr
1/2 part done by 8*1/2=4 hrs
total time taken=8+4=12 hrs
Answer:12 hrs

Q-6:A cylindrical rod of iron, whose height is equal to its radius, is melted and cast into spherical balls whose radius is half the radius of the rod.Find the number of balls? [Basic Bank- (AM)-2018 Preliminary]
Suppose ,
The radius of cylindrical rod=r
So, the height of cylindrical rod=r
From condition,the radius of spherical ball= r/2
area of cylindrical rod = $\pi.r^2.r=\pi r^3$
Again area of spherical ball
$=4/3\pi(r/2)^3$
$=\pi r^3/6$

So,The numbers of balls
$=(\pi r^3)/(\pi r^3/6)$
=6
Answer:6

Selected Written Math

1:Six pipes are fitted to a water tank. Some of these are inlet pipes and the others outlet pipes . Each inlet pipe can fill the tank in 9 hrs and each outlet pipe can empty the tank in 6 hrs.On opening all the pipes, an empty tank is filled in 9 hrs. How many inlet pipes are there?

Written Base Solution:
Give that,
Total no. of pipes=6.
Let no. of inlet pipes be x.
Then, no. of outlet pipes will be
(6-x).
Part of tank filled by 1 inlet pipe in 1h= 1/9.
So, Part of tank filled by x inlet pipes in 1h= x/9.
Similarly,
Part of tank emptied by 1 outlet pipe in 1h=1/6.
So, Part of tank emptied by (6-x) outlet pipes in 1h= (6-x)/6.
Now when both of them are opened at the same time:-
Part of tank filled in 1h
= (x/9) - (6-x)/6 = (15x-54)/54.
in 9h tank filled
={(15x-54)*9/54}
= (15x-54)/6,
which must be equal to 1
(as tank gets filled in 9h)
So,{(15x-54)/6}=1
=> (15x-54)=6.
=> 15x=60.
=> x=4.
Thus the solution is:- there are 4 inlet pipes and 2 outlet pipes.
Ans:4

2:Mr Robert completes a journey in 10 hours,he travels first half of the journey at the rate of 21 km/hr and second half at the rate of 24 km/hr .Find the total journey in km.
Solution:
Let

Total journey be x km
Half of the journey b x/2 km
Now,
21 km go....1 hour
1 km go.....1/21 hour
x/2 km go.....x/2*1/21=x/42 hour

Again,
24 km go.....1 hour
x/2 km go.....1/24*x/2= x/48 hour
According to the question,
x/42+ x/48= 10
So, x= 224 km
Answer:224 km

3:A can complete a piece of work in 36 days, B in 54 days and C in 72 days. All the three began the work the work together but A left 8 days before the completion of the work and B 12 days before the completion of work. Only C worked up to the end. In how many days was the work completed?
Solution:
Let
the work be completed in x days.
C work for x days
then A works for (x-8) days
and B works for (x-12) days.

According to the question,
[(x-8)/36 + (x-12)/54 + x/72] = 1
[(6x-48+4x-48+3x)/216] = 1

13x-96 = 216;
13x = 216+96 = 312;
x = 312/13 = 24 days.

Ans:24 days

4:A tank is fitted with 8 pipes, some of them that fill the tank and others that are waste pipe meant to empty the tank. Each of the pipes that fill the tank can fill it in 8 hours, while each of those that empty the tank can empty it in 6 hours. If all the pipes are kept open when the tank is full, it will take exactly 6 hours for the tank to empty. How many of these are fill pipes?
Solution:Written Base
Give that,
Total no. of pipes=8.
Let no. of inlet pipes be x.
Then, no. of outlet pipes will be
(8-x).

Part of tank filled by 1 inlet pipe in 1h= 1/8.
So, Part of tank filled by x inlet pipes in 1h= x/8.
Similarly,
Part of tank emptied by 1 outlet pipe in 1h=1/6.
So, Part of tank emptied by (8-x) outlet pipes in 1h= (8-x)/6.
Now when both of them are opened at the same time:-
Part of tank empted in 1h
= (8-x)/6 - x/6 = (32-7x)/24
in 6h tank filled
={(32-7x)/24}*6
=32-7x/4
which must be equal to 1
(as tank gets filled in 9h)
So,
32-7x/4 =1
=> x=4

Thus the solution is:- there are 4 inlet pipes and 4 outlet pipes.
Ans:4

Short cut:
Let,
X pipe fill
AND
Empty water pipe =(8-X)
IN 1hr 1/6th is emptied
so,
x/6 - (8-x)/8 = 1/6
ON SOLVING X=4 (FILL PIPES) AND 8-X=4(EMPTY PIPES)

Another solution:
Let
total capacity of the tank 24 unit
[LCM of 8,6=24]
Suppose ,fill pipe x
waste pipe 8-x
In 1 hour 1 pipe fill 24/8=3unit
In 1 hour x pipe fill 3x unit
In 1 hour 1 pipe waste 24/6=4unit
in 1 hour (8-x) waste 32-4x unit
In 1 hour all do 32-4x-3x=32-7x
In 6 hour they do 192-42x unit
According to the question,
192-42x=24
42x=168

x=4
Answer:4

5:Two taps A & B can fill a tank in 5 and 20hrs respectively.if both taps are open then due to leakage,it took 30min more to fill tank.If the tank is full,how long will it take for the leakage alone to empty the tank?
Solution:
Part filled by (A + B) in 1 hour
= (1/5 + 1/20)
= 1/4.
So,
A and B together can fill the tank in 4 hours.
With leak it requires 9/2 (4+1/2) hour to fill,
So with leak in 1 hour together they fills 2/9 part.
Work done by the leak in 1 hour
= (1/4 - 2/9)
= 1 / 36.
Therefore, Leak will empty the tank in 36 hrs.
Ans:36 hrs

6:A, B and C can independently do a work in 15 days, 20 days and 30 days, respectively. They work together for sometime after which C leaves. A total of $ 18000 is paid for the work and B gets $ 6000 more than C. For how many days did A work?
Solution:
Since A and B work at different rates, they will get paid differently.

A's rate = total work/15hours
B's rate = total work/20hours

A's rate/B's rate = 4/3
A's rate = 4/3 * B's rate
This means A gets 4/3 times what B gets
We know that B gets (6000+C)
Therefore A's amount
= 4/3 * (6000+C)
= 8000 + (4C)/3
So,
A gets 8000 + (4C)/3
B gets 6000 + C
C gets C

14000 + 2C + (4C)/3
From question,
14000 + 2C + (4C)/3=18000
Or, 2C + (4C)/3 =4000
Or, (6C)/3 + (4C)/3=4000

Or,(10C)/3 =4000
Or, C = 12000/10 =1200

Amount paid to each person
A gets 8000 + (4C)/3 = 9600
B gets 6000 + C = 7200
C gets 1200
Let,
A ,B & C together work =x day's
And
Remaining work done A & B=y day's
So,
A work = (x+y)day's
B work = (x+y)day's
C work = x day's
According to the question,
Or,(x+y)/15 + (x+y)/20 + x/30 =1
Or,4(x+y)/60 + 3(x+y)/60 + 2x/60 =1
Or,(9x + 7y)/60 = 60/60
Or, 9x + 7y = 60--------(1)
We know that,
Amount is divided with their working ratio
Work done by B / work done by C
= 7200/1200 = 6
So,
Or,[(x+y)/20] / [x/30] =6
Or,[(x+y)/20] * (30/x)=6
Or,3/2 * (x+y)/x = 6
Or,3/2 * (1 + y/x) = 6
Or,(1 + y/x) = 4
Or,y/x = 3
Or,y = 3x
Putting the value of y=3x in equation (1)
9x + 7y = 60
9x + 7(3x) = 60
Or,x=2
If x=2;
y = (60-18)/7=6
And
x+y = 2+6 =8 day's

Answer: 8 days

8:A train which travels at a uniform speed due to some mechanical fault after traveling for an hour goes at 3/5th of the original speed & reached the destination 2hours late. If the fault had

occurred after traveling another 50 miles, the train would have reached 40 minutes earlier.What is the distance between the two stations?

Solution:
Let,
Distance between the two stations be=D
Original speed=x kmph
Reduced Speed = 3x/5 kmph
According to the question,
50/(3x/5)-50/x=40/60
Or, (50*5/3x)-50/3=2/3
Or, (250-150)/3x=2/3
Or, x = 50
So,
Original speed=x =50 kmph
Reduced Speed = 3x/5=3*50/5=30 kmph
Again,
Time=Distance/Speed
{1+(D-50)/30}={D/50+2}
Or, (D-50)/30- D/50= 2-1
Or,(10D -500-6D)/300=1
Or, 4D=300+500
Or, D=200
So, Distance between two station is 200 km
Ans:200 km

9:A bike running at 80 km/h initially is slowed down to 60 km/h as soon as the fuel indicator touches the half level mark.It keeps running at this speed till it runs out of fuel, thereby covering a total distance of 640 km in 10 hours. If the bike consumes 2 litres of fuel per hour, what is the capacity (in litres) of the fuel tank of the bike?
Solution:
Let
The time the bike runs at 80 km/h = h hours
And
The time taken the bike runs at 60 km/h =(10-h)
The bike covering the distance=640 km
According to the question,
Or,80h + 60(10 - h) = 640
[Speed*Time=Distance]
Or,80h + 600 - 60h = 640
Or,20h = 40
Or,h = 2

Thus, the bike runs at 60 km/h for 10 - 2 = 8 hours, which will consume 8 x 2 = 16 litres of fuel since the bike consumes 2 litres of fuel per hour.

Recall that the bike starts to run at 60 km/h when the fuel tank is half full, so the tank must have 32 litres of fuel when it's full.

Answer:32 litres

10:An empty fuel tank of a car was filled with A type Petrol.when the tank was 1/2 empty,it was filled with B type Petrol. Again when the tank was half empty, it was filled with type A petrol.When the tank was 1/2 empty again, it was filled with B type petroleum. what's the % of A type petroleum at present in the tank?

Let
The capacity of the tank be 100 litres.
Initially: A type petrol = 100 litres.

After first operation:
A type petrol = [(100/2)] = 50 litres;
B type petrol = 50 litres.

After second operation:
A type petrol = [(50/2 + 50)] = 75 litres;
B type petrol = [(50/2)] = 25 litres.

After third operation:
A type petrol = [(75/2)] = 37.5 litres;
B type petrol = [(25/2 + 50)] = 62.5 litres.
Required percentage = 37.5%.
Answer:37.5%

11:A sum of Tk. 1260 is borrowed from a money lender at 10% p.a compounded annually. If the amount is to be paid in two equal annual installments, find the annual installment
[Basic Bank AO-2014]
Solution:
Let,
Each annual installment is x tk
Given that,
Sum/PW =1260 Tk
Rate(R)=10%
Time(T)=2 years

#Present installment of 1260 tk due 1 year hence + Present installment of 1260 tk due 2 year hence
So,
1260={x/(1+ 10%)^1} + {x/(1+10%)^2}
Or, x=726

So,
Annual installment is 726 tk
Answer:726 tk

12:A sum of money is borrowed and paid back in two annual instalments of tk 882 each allowing 5% compound interest.The sum borrowed was:
[JBL EO -2017]
Solution:
Give that,
Each year installment x=882 tk
Rate(R)=5%
Time(T)=2 year
Present Worth of 882 tk due 1 year hence + Present Worth of 882 tk due 2 year
So,
PW/Sum={x/(1+5%)^1+{x/(1+5%)^2}
Or, PW={882/(1+5%)^1}+{882/(1+5%)^2}
Or, PW =1640 tk
Answer:1640 tk

13 :A can complete a project in 20 days & B can complete the same project in 30 days. A & B start working on the project together & A quits 10 days before the project is expected to be completed. How many days in total will the project take to complete?
[JBL AEO(RC)-2017]
Solution :
A 20 দিনে করে 1 অংশ কাজ
A দিনে করে=1/20 অংশ
B 1 দিনে করে=1/30 অংশ
A & B একএে 1 দিনে করে=1/12 অংশ
A ও B একত্রে Full কাজ করে 12 দিনে
**10 দিন আগে A চলে যায়
তাহলে দুজন একত্রে(12-10) =2 দিন কাজ করে।
12 দিনে দুজনে করতো 1 অংশ
2 -------={2/12} অংশ
=1/6
Remaining ={1-1/6}
=5/6 অংশ
***বাকী 5/6 অংশ করতে B এর সময় লাগে
B ১ অংশ করে 30 দিনে
এতএব,5/6-------{20*5/6}

=25 দিন
মোট সময় ={25+2}=27 দিন
উওর:27 দিন।

14.There are 2 points A & B are in a straight road, From point A bike starts at 1:00 p.m & From point B a car whose speed is double of bike starts at 2 p.m towards each other. They meet at point C which is 168 km away from A. At 3:40 p.m find the distance between A & B?
Solution:
Bike's time taken=8/3 hrs
Car's time taken=5/3 hrs
Bike's speed =» 168*3/8 = 63
Car's speed=»126 km?hr
Car traveled =» 126*5/3 = 210
Total Distance =» 168+210 = 378

15.In a race of 10 km A beats B by 1 km and B beats C by 1 km so tell by how many metres A beats C?
Solution:

A:B=10:9
B:C=10:9.
B go 10 km C 9km
B go 9km th C=9*9/10=8.1 km
so A beat C by=10-8.1=1.9 km or 1900 meter

16.A dishonest dealer marks up the price of his goods by 20% and gives a discount of 10% to the customer besides; he also cheats both his supplier and his buyer by 100 grams while buying or selling 1kg. Find the % profit earned by the shopkeeper.

Solution:
#While buying,
He buys 1100 gram instead of 1000 gram.
Suppose
He bought 1100 grams for Tk 1000.

#While selling,
He sells only 900 grams when he takes the money for 1 kg.
Given that,
Mark up price=20% above
Discount=10%
So overall profit
=[20+(-10)+(20*-10)/100]=8%
Hence,
His selling price is 8% profit is Tk 1080 for 900 grams.

Now,
900 gms sp =1080.tk
1100 ----------=1080*1100/900
=1320 tk
Profit percentage:
(1320-1000)*100/1000=32%
Answer:32%

17. The difference between a two -digit number and the number obtained by interchanging the digits is 36.What is the difference between the sum and the difference of the digits of the number if the ratio between the digits of the number is 1:2?
Solution:
Given that,
The ratio of the number is 1:2
Suppose,
Unit digit number be x
and ten digit number be 2x
Original number=10*2x+x=21x
According to the question,
(10*2x+x)- (10x+2x)=36
or x= 4

Difference between the sum of the digit and difference of the digit
= (2x+x)- (2x-x)= 2x
As x= 4 so the result is 2*4= 8
Answer:8

18:A man could buy a certain number of notebooks for Tk 300.If each notebook cost is Tk 5 more,he could have bought 10 notebooks less for the same amount.Find the price of each notebook?
Solution:
Let,
original price of each book=x tk
So, increased price=x+5 tk
According to the question,
(300/x)-(300/x+5)=10
Or, {(300x+1500-300x)/x(x+5)=10
Or,x=10
Answer:10

19:A, B and C independently do a work in 15 days, 20 days and 30 days respectively. They work together for sometime after which C leaves. A total of tk. 18000 is paid for the work and B gets 6000 more than C. For how many days did A work?
Solution:
A and B work same number of days.
So A's payment =B's payment

Let,
C's payment =x
So B's payment =x+6000
So x+6000+x+6000+x=18000
3x=6000
x=6000/3=2000
Now ratio of A,B and C 's payments=(2000+6000):(2000+6000):2000
=8000:8000:2000
=8:8:2
So 8/15+8/20+2/30=1
(32×24+4)/60=1
60/60=1
So A works for 8 days

Answer:8 Days

20.A motorboat, whose speed in 15 km/hr in still water goes 30 km downstream and comes back in a total of 4 hours 30 minutes. The speed of the stream (in km/hr) is:
Solution:
Suppose,
Speed of stream=x
Upstream speed=(15+x)km/hr
Downstream speed=(15-x)km/hr
And,t1+t2= 4.5 hours
According to the question,
{30/(15+x)}+{30/(15-x)}=4.5
Or, x= 5
Answer:5 km/hr
21.Robi drove 100 miles to visit a friend. If he had driven 8 miles per hour faster than he did, he would have arrived in 5/6 of the time, he actually took. How many minutes did the trip take?
Solution:
Let,
speed x mph
time required 100/x mph
According to the question,
100/(x+8)=(100*5)/6x
=>x=40 mph
40m covered 60 minutes
100m covered {(60*100)/40}
=> 150 minutes
Answer:150 minutes
Alternative:
Ratio of Time = 5:6
So, Ratio of Speed = 6:5

Extra Speed = 6-5 = 1
Now 1 part = 8 mph;
Then, 5 part = 40 mph
So, Time = D/S = 100/40 = 2.5 hr or 150 min
Answer:150 minutes

22:The digit in the unit place of a number is equal to the digit in the tens place of half of that number and the digit in the tens place of that number is less than the digit in units place of half of that number by 1. if the sum of the digits of the number is 7. then what is the number?

Solution:
Let
The digit in units place be y
The digit in tens place be x

Then, number is 10x+y
Digit in the tens place of half of the number =y
Digit in the units place of half of the number =(x+1)
Therefore, half of the number =10y+(x+1)
According to the question,
(10x+y)/2=10y+x+1
8x-19y=2--------(1)
From question,
X+Y=7----------(2)
(2)*2-(1)=»
8x+8y=56
8x-19y=2

27y=54
y=2
From equations no(2)
X=7-2=5

Required number is =(10*5+2)=52
Answer:52

23:If 5 is added to the sum of two digits of a number consisting of two digits, the sum will be three times the digits of the tens place. Moreover, if the place of the digits are interchanged, the number thus found will be 9 less the original number. Find the number.
Solution:
Let,
Unit place=x
Tenth place=y
Thus,Number=10y+x
First condition,
x+y+5=3y
y=(5+x)/2----------(1)

If the digit are interchanged
Then New number=10x+y
Now the second condition,
10x+y=(10y+x)-9
Or, x-y=-1
Or,x-(x+5)/2=-1
[Pulling the value of y]
X=3
From equations(1)
y=4

So,the number=(10*4+3)=43
Answer:43

24:A train travelling at 48 kmph completely crosses another train having half its length and travelling in opposite direction at 42 kmph, in 12 seconds. It also passes a railway platform in 45 seconds.The length of the platform is - ?
Solution:

Let,
The biggest train length=2x
The smallest train length=x
Since two train are opposite direction
So,Relative speed=(48+42)
=90kmph
=90*(5/18)
=25 m/s
We know,
12*25=(x+2x)
X=100
Biggest train length
=2*100=200 m
Again
Let,
Platform length=M
48kmph
=48*(5/18)m/s
=40/3 m/s

We know,
Time*speed=Distance
45*(40/3)=200+M
M=400 m
Answer:400 m

25.With both inlets open, a water tank will be filled with water in 48 minutes. The first inlet alone would fill the tank in 2 hours.What is the capacity of the tank in cubic meters, if in every minute the second inlet admits 50 cubic meters of water more than the first?

Solution:
LCM of 48 and 120 = 240
(A+B)'s efficiency = 240/48 = 5
And A's efficiency = 240/120 = 2
So, B's efficiency = 5-2 = 3;
And B is more efficient than A by
3-2=1
Now, 1 is 50 cm;
Then, 240 is 240*50 = 12000 cm

Answer:12000 cm

26:Equal amount of water were poured into two empty jars of different capacities, which made one jar 1/4 full and other jar 1/3 full. If the water in the jar with lesser capacity is then poured into the jar with greater capacity, what fraction of the larger jar will be filled with water?
Solution:
Let,
Capacity larger jar = x
And
12 litters water poured into each jar[LCM OF 4,3=12]
so x*1/4 =12
x = 48
Total water of larger jar after pouring the water of smaller jar
= 12+12= 24
Required fraction
=24/48
= 1/2

Ans:1/2

27:A and B together can do a piece of work in 12 days, which B and C can do in 16 days. After A has been working at it for 5 days and B for 7days C finishes in 13 days. In how many days C alone will do the work?
Solution:
Work done by A & B in 1 day=1/12
Work done by B & C in 1 day=1/16
Let,
Work done by C in 1 day=x
From question,
Work done by A in 5 days+ B in 7 days+ C in 13 days=1
So,
(A+B)'s 5 days work+(B+C)'s 2 days work + C's 11x days work=1
Or, (5/12)+(2/16)+11x=1
Or, x =1/24
So, C alone can finish the work it in 24 days
Answer:24 days

Solution-2:
Let,
Total work be 48 units
(LCM of 12 and 16)
(A+B)'s 1 day work =48/12=4 units
(B+C)'s 1 day work =48/16=3 units

ATQ,
A's 5 days work + B's (7-5) days work + C's (13-2)days work=48
=>(A+B)'s 5 days work +(B+C)'s 2 days work +C's 11 days work=48
=>(4*5)+(3*2)+11C = 48
=>20+6+11C=48
=>C= 2 (per day work of C)

So, C can do the job alone in 48/2=24 days
Answer:24 days

28.A tank can be filled by a tap in 20 minutes and by another tap in 60 minutes. Both the taps are kept open for 10 minutes and then the first tap is shut off. After this, the tank will be completely filled in what time ?

Solution:
Work done by both in 1 minute
= (1/20+1/60)
= 4/60 portion
=1/15 portion

Work done by both in 10 minute
=10/15=2/3 portion
Remaining part
=(1 - 2/3)
= 1/3 portion

Now, 1/60 part is filled in 1minute.
So, 1/3 part will be filled in 20 minute.
Answer:20 mim

29 :A can complete a project in 20 days and B can complete a project in 30 days. A and B start working in the project together and A quits 10 days before the project is expected to be completed.How many days in total will the project take to complete?

Whole work done A+B in
=(20*30/20+30)
=(600/50)
=12 days
A quits before 10 days means A work 2 days
Let,
Actual Time= x days
According to the question,
2/20+x/30 =1

or, x =27
The project take to complete in 27 days
Answer:27 days

30.A merchant used 120 cm tape instead of 1 meter tape while buying a cloth. While selling he used a 80 cm tape instead of a 1 meter tape but he offers a 20% discount while selling. What is the overall profit of the merchant?
Solution:
120 cm buying price 100/120
Then, selling price=100/80
at 20% discount;
Profit =1-5/6=1/6
So, profit % ={1*6*100/6*5}
=20% Answer:20%

31. A, B and C can do a piece of work in 20, 30 and 60 days respectively. In how many days can A do the work if he is assisted by B and C on every third day?
Solution:
Let,
Total work be =60
[LCM of 20, 30 & 60]
A's efficiency=60/20=3 units
B's efficiency=60/30=2 units
C's efficiency=60/60=1 units
3 days work done by A+B+C= (3*3+1*1+2*2)=12 units

So, Time required=60/12
=5*3
=15 days
Answer:15 days

33:After distributing the sweets equally among 25 children,8 sweets remain.Had the number of children been 28, 22 sweets would have left after equally distributing.What was the total number of sweets?

Solution:
Let,
Total no of sweet is =x
First case,
25 children got 'y' sweet each
X=25y +8 --------(1)
Second case,
28 children got 'z, no of sweet each
X=28z +22-------(2)
Where y & z are natural number
y > z
From (1) & (2)
25 y =14(2z +1)

Z=1,2,3.....
If z =12
Then y =14
Total no of sweet=25*14+8=358
Answer:358

34:A sum of tk. 1260 is borrowed from a money lender at 10% p.a. compounded annually. If the amount is to be paid in two equal annual installments, find the annual investment?
Solution:
Let,
::
Annual instalment be =x
According to the question,
x +
x(1+10/100)=1260(1+10/100)^2
Or, x =726
So,
Annual instalment is 726 Tk
Answer:726 Tk

35:Mr. X bought a scooter for a certain sum of money. He spent 10% of the cost on repairs and sold the scooter for a profit of tk 1100. How much did he spend on repairs if he made a profit of 20%.
Solution:
Given that,
Total Profit = 1100 Tk
According to the question,
20% = 1100,
100% ={(1100*100)/20}= 5500 Tk

Tk 5500 would be the cost price for Mr X
He spends 10% on repairing.
So, Initial Cost + Repair Cost
= 5500 Tk
Let ,
Initial Cost was Z.
Then
Z + 10% of X = 5500
Or,1.1 Z= 5500
Or,Z = 5500/1.1
Or,Z = 5000
The initial cost price was Tk 5000.
Thus, he spends Tk 500 on repairing.
Answer:: 500 Tk

36:1 year ago the ratio between A's & B's salary was 3:4. Ratios of their individual salaries between last year's and this year's salaries are 4:5 & 2:3 respectively. At present the total of

their salary is tk. 4160. The salary of A now ,is :
Solution:
Written Based Solution:
Given that,
(A & B)'s 1 years ago salary ratio
=3:4
=300:400[Multipy 100]
For A :
Last year:Present year=4:5
Previous Year salary 4 then present =5
Previous Year 300 then present year=(300*5)/4=375

For B:
Last year:Present year=2:3
Previous Year salary 2 then present year=3
Previous year salary 400 then present year=(400*3)/2=600 Tk
Let,
A's present salary=375x
B'present salary=600 x
According to the question,
375x + 600x=4160
Or, x =4.27
Now ,
A 's salary is
=4.27*375
=1600
Answer:1600 Tk

For MCQ:
(3:4)*4=12:16
(4:5)*3=12:15
(2:3)*8=16:24
15*4160/39=1600

37.The Distance between two stations, Dhaka and Chittagong is 450km.A train starts at 5 pm from Dhaka and moves towards Chittagong at an average speed of 60km/hr .Another train starts from Chittagong at 4.20pm and moves towards Dhaka at an average speed of 80 km/hr .At what time will the two trains meet?
Solution:
Let,
Meet point x km
Time=40 min = 40/60 = 2/3 hr
Total distance = 450 km
According to the question,
{(450-x/80)}- {x/60}=2/3
Or, x = 170

So, train meet at = 4 pm + 170/60
= 4 pm + 2 hr5 m = 6.05 PM

Answer:6.05 PM

38.A shopkeeper bought 140kg of sugar from a wholesaler. The wholesaler uses a faulty weighing machine which displays a reading of 2 kg less for every 20 kg. Had the wholesaler used the correct weighing machine, the profit earned would have been of 16.66%.The cost price of sugar for the wholesaler was.Tk 12 per kg. What was the profit earned by the wholesaler by using the faulty machine?
Solution:
২০ কেজিতে ২ কেজি কম দেখাচ্ছে
অর্থাৎ ২২ কেজি মাল ২০ কেজি দেখাচ্ছে
দিচ্ছে = ২২*১৪০/২০
= ১৫৪ কেজি
ক্রয় মুল্য = ১৫৪*১২ = ১৮৪৮
দাম নিচ্ছে = ১৪০ কেজির
বিক্রয় মুল্য = ১৪০*১৪
= ১৯৬০টাক
লাভ = ১৯৬০-১৮৪৮
= ১১২ টাকা
% লাভ=১১২*১০০/১৮৪৮
= ৬.০৬%[answer]

39.The price of an article increase by 20% and a man now get 10kg less, if he also reduce his consumption by 20%, then find how much kg of article he used to purchase in normal price?
Solution:
Let,
Total money = x
if consumption 20% decreases
Total money also 20% decreases
So,
It will be = 0.8x
Suppose,
Initial price per kg = 100
Amount= x/100
At 20% increase
price per kg = 120
amount = 0.8x/120
According to the question,
(x/100)- (0.8x/120)=10
Or,6x-4x/600 = 10

Or,2x = 600*10
Or, x = 3000 tk

Hence,Initial amount = 3000/100
= 30 kg
Answer:30 kg

40.A train which travels at a uniform speed due to some mechanical fault after traveling for an hour goes at 3/5th of the original speed & reached the destination 2hours late. If the fault had occurred after traveling another 50 miles, the train would have reached 40 minutes earlier. what is the distance between the two stations?

Solution:

Suppose,
Distance between the two stations=D
Original speed=x kmph
Reduced Speed = 3x/5 kmph

ATQ,
50/(3x/5)-50/x=40/60
On solving, we get x = 50

Original speed=x =50 kmph
Reduced Speed = 3x/5=3*50/5=30 kmph

We know that Time=Distance/Speed
1+{(D-50)/30}={D/50+2}
=> (D-50)/30- D/50= 2-1=1

On solving, we get D= 200

Ans:200 km

41.A software engineer has the capability of thinking 100 lines of code in five minutes and can type 100 lines of code in 10 minutes. He takes a break for five minutes after every ten minutes. How many lines of codes will he complete typing after an hour?

Solution:
We can divide 60 min into 3 parts as 20 min per part.

First 20 min:
5 min think + 5 min type + 5 min break + 5 min type = 20 min and type 100 lines

Second 20 min:
5 min think + 5 min break + 10 min type = 20 min and type 100 lines

Third 20 min:
5 min break + 5 min think + 5 min type + 5 min break= 20 min and type 50 lines

Total time=60 min
Total lines of codes typing=250

Ans: 250 lines

42: The speed of a railway engine is 42 Km per hour when no compartment is attached and the reduction in speed is directly proportional to the square root of the number of compartments attached.If the speed of the train carried by this engine is 24 Km per hour when 9 compartments are attached,what is the maximum number of compartments that can be carried by the engine?
Solution:
suppose,
The speed of the railway engine, S = 42 - K√x. where x is the number of compartments and K is a constant.
according to the question:
24 = 42 - K√9
or, K = 6.
the engine can carry a maximum of that number of compartments for which its speed is greater than
zero.
suppose, R is the maximum number of compartments.
so,
42 - K√R > 0
or, 6√R < 42
or, √R < 7
or, R < 49
greatest integer value of R that is less than 49 is 48.
so, 48 is the maximum number of compartments that the railway engine can carry.

Answer:48
43: Mr. Karim deposited a certain amount of money for a fixed period of time. On maturity, he received a total of Tk. 45000 when the ratio of interest and investment became 2:5. If the interest rate was 3.6%, calculate the time period for which the money was invested.
Solution:
investment =5x
interest =2x
ATQ,
5x+2x=45000
x=6429
so, investment 5x =5*6429 =32145
interest 2x=2*6429 =12858
We know, I=P*N*R
12858=32145*n*3.6/100
n=11 years
Answer:11 Years

41: A man and a boy can finish a work by 8 days. 2 men and 4 boys can finish this work by 3 days.How many days need for a boy to finish this work?
Solution:
1m+1b=1/8.....(1)
2m+4b=1/3.....(2)
(1)×2-(2)
2b=1/12
b=1/24
Hence we get, 1 boy can do the job in 24 days

Answer:24 Days
44: A person bought an article and sold it at a loss of 10%.If he had bought it for 20% less and sold it for tk.55 more, he would have made a profit of 40%.what was the cost of the article in taka?
Solution: let, CP=x
SP=.9x
New CP=.8x
New SP=.9x+55
ATQ,
.9x+55-.8x=.8x*.4
or, x=250
Alternative:

Let original CP be x
First SP = 9x/10
New CP = 4x/5
New SP = 140% of 4x/5 = 28x/25 ATQ 28x/25 - 9x/10 = 55
Or, x = 250 (Answer)

45: A school has raised 75% of the amount it needs for a new building by receiving an average donation of tk 60 from the people already solicited. The people already solicited represented 60% of the people the college will ask for donations. If the college is to raise exactly the amount needed for the new building, how much must the remaining people donate per person?
Solution:
Let total No. of people be 100.
So, Donation Received = 60*60 = 3600
Now, 75% donation = 3600
Then, 100% donation = 3600*100/75 = 4800
Remaining donation = 4800-3600 = 1200
Remaining people = 100-60 = 40

per person donation to be solicited = 1200/40 = 30

Answer:30

46: The volume of a wall 5 times as high as it is broad & 8 times as long as it is high, is 12.8 cubic meters. The breadth (in cm) of the wall is?

Solution:

Let the breadth of the wall be x metres

Height = 5x metres

length = 40x metres.

x * 5x * 40x = 12.8

x^3=12.8/200

x=4/10 m

x=4/10 *100 =40 cm

47: A boat sails M miles upstream at the rate of R miles per hour. If the rate of the stream is S miles per hour. How long will it take the boat to return to its starting point?

Solution:

Let speed of boat in still water is x mph

Upstream speed r=x-s

r+s=x

Now downstream speed= x+s

=r+s+s

=r+2s

Required time= m/ r+ 2s

50: The sum of two numbers is 15 and sum of their squares is 113.The numbers are?

Solution:

x+y=15

$x^2+y^2=113$

$(x+y)^2$ - 2xy=113

225 - 2xy=113

2xy=112

xy=56

$(x-y)^2=(x+y)^2$ - 4xy=225 - 4*56

$(x-y)^2=1$

x-y=1

x+y=15

2x=16

x=8

y=7

answer: 8 & 7

48: A computer company offered to sell a city agency new machines at a 15% discount from the price list, and to allow the agency Tk. 8500 for each of two old computers being traded in the list price of the new machine is Tk. 62500. If the agency accepts the offer, how much money will it have to pay for the 4 new machines?
Solution: total list price=62500*4=250000
price after discount =250000*.85=212500
price have to pay=212500-(8500*2)=195500
Alternative:
list price= 62500
15% discount, Selling price = 85% of 62500 = 53125
so, SP of 4 computers= 53125 X 4 = 212500
exchanging amount of 2 computer = 8500 X 2 = 17000 tk
so, actual paying amount = 212500- 17000= 195500 tk
Answer: 195500 tk

49.The sum of two numbers is equal to thrice their difference. If the smaller of the number is 10.find the other number
Solution:

Let,The larger number be= x
According to the question,
x+10 = 3(x-10)
or, x+10 = 3x-30
or, -2x=-40
Or,x = 20
Answer:20

50:A makes an article for TK.120 and sells it to B at a profit of 25% .B sells it to C who sells it for TK.198 making a profit of 10%. What profit percent did B make?Solution:
25% profit
A's Selling price=125% of 120
=150Tk
=B'Cost price
10% Profit
C's Sp=110 TK
SP 110 TK Then CP=100 tk
«»198«»«»«»«»«»=[100*198]/110
= 180 Tk
=B's Selling Price
So B profit
=[(180-150)/150]*100
=20%
Answer:20%

51:A sum of TK.600 amounts to TK.720 in 4 years at simple interest. What will it amount to if the rate of interest is increased by 2% ?[Difficult]
Solution:
Let
Rate of interest=r%
We know
P=100*a/100+(r*t)
Or, 600=(100*720)/[100+(4*r)]
Or, r =5
Rate increased by 2%=(5+2)=7%
Again we know
I=Prn
Or, I=(600*7*4)/100
Or, I =168 Tk
So Amount=(600+168)=768 Tk
Answer:768 Tk

52:3 years ago , the average age of a family of 5 members was 17 years . A baby having been born , the average age of the family is the same today. The present age of the baby is
Solution:
3 years ago 5 member average age=17 years
Now their present average age
=17+3=20 years
And
Their total age now=20*5=100
5 person with baby's now total age=6*17=102 years
The present age of baby
=(102-100) years
=2 years
Answer:2 years

53:There are two numbers such that the sum of twice the first and thrice the second is 39, while the sum of thrice the first and twice the second is 36. The largest of the two is
Solution:
Let,
The first number is x
and
Second number is y
First condition, 2x+3y = 39---(1)
2nd condition 3x+2y = 36----(2)
By solving the 1 & 2 equation we get x = 6 and y = 9
So, largest number is 9
Answer:9

54:A person was asked to state his age in years .His reply was , “take my age three years hence , multiple is by 3 and then subtract three times my age three years ago and you will know how old I am ” What was the age of person ?
Solution:
Person present age=x years
After 3 years=x+3
Before 3 years=x-3
According to the question,
3(x+3)-3(x-3)=x
Or,3x+9-3x+9=x
Or, x=18
Answer:18 years

55:In an election, 30% of the voters voted for candidate A whereas 60% of the remaining voted for candidate B.The remaining voters did not vote. If the difference between those who voted for candidate A and those who did not vote was 1200, how many individuals were eligible for casting vote in the election ?
Solution:
Candidate A got = 30%
Remaining vote= 100-30 =70% Candidate B got = 70of60%
= 42%
The voters did not vote
=(70-42)= 28%
Difference of A and did not vote is 30-28 = 2%
So========
2%«»«»»«»«»»«»«120
100%««»«»«»«»«»
= (120*100)/2=60,000
Answer:60000

56:A shopkeeper expects a gain of 22.5% on his cost price . If in a week his sale was of TK.392 , what was his profit ?
Solution:
Cost price =100%
Gain = 22.5%

122.5%«»«»«»«»392
1% «»«»«»«»«»«»392/122.5
22.5% «»«»«»«»«»[392*22.5]/122.5
=72 Tk
Answer:72 Tk

57:Two taps A and B can fill a tank in 5 hours and 20 hours respectively . If both the taps are open then due to leakage , it took 30 minutes more to fill the tank . If the tank is full , how long

will it take for the leakage alone to empty the tank ?
Solution:
MCQ Way===
Both A+B time taken
=A*B/A+B
=5*20/5+20
=4 hrs
Due to a leakage time taken to fill the tank=(4+.5)=4.5 hours
So leakage pipe time taken to empty
=(4.5*4)/4.5-4
=36 hrs
Answer:36 hrs

58:A train can travel 50% faster than a car. Both start from point A at the same time and reach point B 75kms away from A at the same time . On the way , however , the train lost about 12.5 minutes while stopping at the station . The speed of the car is
Solution:
Speed ratio of Train and Car
=150:100
= 3:2
Let,
Speed of train=3x
Speed of car=2x
According to the question,
75/2x -75/3x=12.5/60
Or, x = 60
The speed of the car=2*60
=120 km/hr
Answer:120 km/hr

59:In a certain store the profit is 320% of the cost .If the cost increases by 25% but,the selling price remains constant,approximately what percentage of the selling price is the profits?
Solutions:
Initial cost price = 100 Tk
320% profits sell price = 420 Tk
25% increase CP = 125 Tk
Profit =(420-120)=295 Tk
Percentage of profit
=(295*100)/420
=70%
Answer:70%
14.
A:C = (2:1)*3= 6:3

A:B = (3:2)*2 =6:4
B gets = 157300*4/13 = 48400

60:A sum of money lent out at simple interest amounts to Tk 720 after years and to Tk 1020 after a further period of 5 years.The sum is
Solution:

7yr sum+profit = 1020 Tk
2 yr sum+profit = 720 Tk
---
5 yr «»«»«»«»«»«»«»300 Tk
2 yr profit «»«»»«»{300*2/5}
=120 Tk
Sum = 720-120= 600 Tk
Answer:600 Tk

61:The ratio between the perimeter and the breadth of a rectangular is 5:1.If the area of the rectangular is 216 sq.cm ,what is the length of the rectangle?
Solutions:
Let,
Length be =x cm
Breadth be=y cm
According to the question,
2(x+y):y=5:1
Or,2x+2y=5y
Or x=3y/2--------(1)
Now
Area=216
Or,xy=216
Or,3y^2=216*2
Or,y=12
So x=12*3/2=18 cm
Answer:18 cm

62:The sum of two numbers is 40 and their difference is 4. The ratio of numbers is
Solution:
Let
first number is x and second number is y
x+ y= 40 --------(1)
x–y= 4 ----------(2)
Solving 1 & 2 equation
x:y = 22 : 18
= 11 : 9 Answer :11:9

63 :A is faster then B. A and B each walk 24km. The sum of their speeds is 7 Km/hr and the sum of times taken by them is 14 hours. Then, A;s speed is equal to
Solution:
Let
The speed of A = x km/hr
and
Speed of B = 7-x km/hr
According to the question,
24/x+24/7-x =14
Or,(168-24x+24x)/7x+x^2=14
Or,(x-3)(x-4)=0
SO
X=3 or 4
A's speed=4 km/h
Because A is faster Than B
Answer:4 km/hrs

64:Two trains are running in opposite directions with the same speed. If the length of each train is 120 meters and they cross each other in 12 second , then the speed of each train(in km/hr) is
Solution:
Let
Speed of each train=x m/s
According to the question,
12=(120+120)/x+x
Or,x=10
So speed of each train
=10*(5/18)
=36 KM/hrs
Answer:36 km/hr

65. A sum of money is borrowed and paid back in two annual installments of TK.882 each allowing 5% compound interest .The sum borrowed was
[Difficult Math]
Solution:
Let,
The sum is =x tk
In first years compound
882=x(1+5/100)^1
Or,882=21x/20
Or,x=840
Second year,
Amount=(840+882)=1722 tk
Second year compunted,
1722=x(1+5/100)^1

Or,1722=21x/20
Or,x=1640
The sum borrowed was=1640 tk
Answer:1640 tk

66:Two trains, train Alpha and Beta run in opposite directions on a circular track. Train Alpha travels at a rate of 4π miles per hour and Train Beta runs at a rate of 6π miles per hour. If the track has a radius of 6 miles and the trains both start from point Delta at the same time, how long, in hours, after the trains depart will they again meet at [GMAT]
Solution-1:
Though,the direction is opposite but the track is circular
So,
The relative speed
=Bet's speed - Alpha's speed
=6π -4π
=2π m/h
Total distance of circular track
=2πr
=2π*6
=12π[Radius=6 miles]
We know
Velocity=Distance/Time
Or,Time=12π/2π
Or, Time=6
Answer:6 hours

Solution-2:
Circumference of the track = 2πr = (2)(π)(6) = 12π miles.

At a rate of 4π miles per hour, the time for Train Alpha to complete one revolution and arrive back at point Delta = (circumference)/(rate) = (12π)/(4π) = 3 hours.
At a rate of 6π miles per hour, the time for Train Beta to complete one revolution and arrive back at point Delta = (circumference)/(rate) = (12π)/(6π) = 2 hours.

Since Train Alpha arrives back at point Delta every 3 hours, and Train Beta arrives back at point Delta every 2 hours, the time required for both trains to meet back at point Delta must be a MULTIPLE of the two times:
3*2 = 6 hours.
In 6 hours, Train Alpha will complete a total of 2 revolutions (one every 3 hours), while Train Beta will complete a total of 3 revolutions (one every 2 hours), with the result that both trains will meet again at point Delta.
Answer:6 hrs

67:A milk vendor has 2 cans of milk. The first contains 25% water and the rest milk. The. second contains 50% water. How much milk should he mix from each of the containers so as to get 12 litres of milk such that the ratio of water to milk is 3 : 5
[Indian Bix]
Solution:
Suppose,
Each can x and y litres of milk and water should be mixed to get water and milk=3:5
Can-1:
Water=x of 25%=x/4
Milk=x of (100-25)%=3x/4

Can-2:
Water=50% of y=y/2
Milk=50%of y=y/2
According to the question,
(X/4+y/2)/(3x/4+y/2)=3/5
Or, x:y=1:1
Sum of ratio=1+1=2
Each can milk should be mixed
=12*1/2
=6 litres
Answer: 6 & 6 litres

68:Tow varieties of sugar are mixed in a certain ratio.The cost of the mix per kg is tk .50 less than that of the superior variety and tk .75 more than that of the inferior variety.What was the ratio of superior variety to inferior variety in the mixture?
Solution:
Let,
Cost price superior variety=x
Cost price of inferior variety=y
Superior quantity unit=a
Inferior quantity unit=b
Total quantity mixture=a+b
Total cost price=ax +by
Mean price=ax + by/a+b
Suppose,
Mean price=z
According to the question,
X - Z=.50 or Z-X=-.50
Z - y=.75 or y- Z=-.75
Now,
Mean price=ax+by/a+b
Or,ax + by/a+b=z
Or,a/b=(y-z)/(z-x)

Or,a/b=-.75/-.25 Or, a:b=3:2
Answer:3:2

69 :A speaks truth in 75% cases and B in 80% of cases. In what percentage are they likely to contradict each other, narrating the same incident
Solution :
Let,
A = Event that A speaks the truth
B = Event that B speaks the truth

Then P(A) = 75/100 = 3/4
P(B) = 80/100 = 4/5

P(A-lie) = 1-3/4 = 1/4
P(B-lie) = 1-4/5 = 1/5

Now
A and B contradict each other =
[A lies and B true] or [B true and B lies]
= P(A).P(B-lie) + P(A-lie).P(B)
= (3/5*1/5) + (1/4*4/5) = 7/20
= (7/20 * 100) %
= 35%

70:A man deposited tk 50000 at a certain interest for 1 yr.After 1 yr he received tk 55280 as both principle & interest after deduction of tk 120 as govt levy and 10% on interest as govt tax.What was the interest rate in percentage?
[MentorsQBank]
Solution:
Here,
Deposited Amount = 50000 Tk
After 1 year
Receiving Amount = 55280 Tk
So,
Interest Received =(55280-50000)
= 5280 Tk
Govt Levy = 120 Tk
So,
Total(120+5280) = 5400 Tk which is (100-10)=90% amount internet

Now,
90% = =========5400
100%======
=[(5400*100)/90]=6000 Tk

Interest = 6000 Tk
Principal=50000 Tk
We know,
I = Pnr
Or, r=I/Pn
Or, r=[6000*100/50000]
= 12%
Answer:12%

71:The ratio between the ages of Mary and her mother is 1: 2 and that of Mary and her father is 1: 3 at the time of Mary's birth. Mary is 10 years old now. Find out the ratio between the ages of Mary's mother and father at this age of Mary.
[GMAT]
Solution:
According to the question,
when Mary took birth,
The ratio between the ages of Mary and her mother is 1: 2
The ratio between the ages of Mary and her father is 1: 3
Let,
'x' is the age of Mary when she is born
Hence, we can say that her mother's age is 2x and her father's age is 3x---------i
Now,
Mary is 10 years old.
Therefore, from equation 1 we can say,
Her mother's age is 2x
i.e. 2 * 10 = 20
and her father's age is 3x i.e. 3 * 10 = 30 at this age of Mary.
Thus, the ages of Mary's mother and Mary's father are in the ratio 20:30 = 2:3

Solution-2:
According to the question,
Mary age:Mother age=1:2
Mary age:Father age=1:3
So,
Mary age:Mother age:Father age
=1:2:3
Let,
X is the present age of each
Mary age=x
Mother age=2x
Father age=3x
From question,
X=10
So,

Mother age=10*2=20 years
Father age=3*10=30 years
Ratio of Mother & Father
=20:30=2:3 Answer:2:3

72:A can contains a mixture of two liquids A and B is the ratio 7 : 5. When 9 litres of mixture are drawn off and the can is filled with B, the ratio of A and B becomes 7 : 9. How many litres of liquid A was contained by the can initially?
[Indian Bix]
Answer:21 litres

100:What is the average(arithmetic mean)of all multiples of 10 from 10 to 400 inclusive?
Solution:
Series=10+20+30.....+4000
Term=[(400-10)/10]+1
=40
Sum=N/2 * (Last term+first term)
=40/2 *(400+10)
=8200
Average of all multiples of 10 from 10 to 400
=8200/40
=205
Answer:205

73:In a division sum,the remainder is zero.A student mistook the divisor by 12 instead of 21 and obtained 35 as quotient.What is the correct quotient?
Let,
Number be=N
So,Number
N=35*12+0
=35*12
Correct quotient=(35*12)/21=20
Answer:20

102:What is the average(arithmetic mean)of all multiples of 10 from 10 to 400 inclusive?
Solution:
Series=10+20+30.....+4000
Term=[(400-10)/10]+1
=40
Sum=N/2 * (Last term+first term)
=40/2 *(400+10)
=8200
Average of all multiples of 10 from 10 to 400
=8200/40

=205
Answer:205

74:In a division sum,the remainder is zero.A student mistook the divisor by 12 instead of 21 and obtained 35 as quotient.What is the correct quotient?
Solution:
Let
Number be=N
So,Number
N=35*12+0
=35*12
Correct quotient=(35*12)/21=20 Answer:20

75.Two trains of equal length are running on parallel lines in the same direction at 46 kilometre/hour and 36 kilometre/hour. The faster train pass to the slowest train in 36 seconds. The length of each train is-
Solution:
Let ,
The length of each train is x meter
Distance will be x+x = 2x
Relative Speed =46-36
=10 km/hr
=10*(5/18)
= 25/9 m/sec
Distance = Speed*Time
Here,
2x = (25/9) X 36
or,x= 50 (Ans)

76.A man buys tk 20 shares paying 9% dividend. The man wants to have an interest of 12% on his money. The market value of each share is-
Solution:
Divided on Tk 20
=(9*20)/100
=9/5
Tk 12 income on Tk 100
Tk 9/5 ----------=(100/12*9/5)
=15 Tk
Answer:15 Tk
77.By selling an article for TK 100 a man gains tk 15 then his gain percentage is -
Solution:
Here,
Selling Price = tk 100
Gain=Tk 15,

Buying or cost price
=(100-15)=Tk 85,
Therefore Gain % =[(15*100)/85]=17.64%
Answer:17.64%

78.The age of a man is 3 times the sum of the age of his two sons. 5 years hence, his age will be double of the sum of the ages of his sons the father's present age is-
Solution:
Let ,
The sum of present ages of the two sons be x
Father's present age = 3x
Here,
(3x + 5) = 2 (x + 10)
Or,3x + 5 = 2x + 20
Or,x = 15.
Father's present age is
(3*15)=45 years(Answer)

79. If tk 64 amount to 83.20 in 2 years what will tk 86 amount to in 4 years in the same rate percent per annum?
Solution:
Let,
Rate of interest be=r
We know
P=(100*Amount)/(100+r*t)
Or,64=(100*83.20)/(100+2*r)
Or, 6400+128*r=8320
Or,r=15%
Again
P=86 Tk
r=15%
T=4 years
I=(86*15*4/100)
=51.6 Tk
After 4 years amount will be
=(51.6+86)=137.60 Tk
Answer:137.60 Tk

80. The sum of a number and its reciprocal is 1/8 of 34. what is the product of the number and its square root
Solution:
Let
The number be x.
Then,

$x + 1/x = 34*1/8$
Or,$8x^2 - 34x + 8 = 0$
Or,$4 x^2 - 17x + 4 = 0$
Or,$(4x - 1)(x - 4) = 0$
$x = 4$
Required number
$=(4 * \sqrt{4})$
$= 4 * 2 = 8.$
Answer:8
81. A sum of money invested at compound interest amounts to Tk 4624 in 2 years and to Tk 4913 in 3 years .The sum of money is.
Solution:
Simple interest(3-2)=1 year
=(4913-4624)=289 Tk
SO,
Rate=[(100*289)/(4624*1)]
=25/4 or 6.25%
Let,
Sum of money be=x
Now,
X(1+25/4*100)^2=4624
Or, X=4096 Tk
Answer:4096 Tk

82.If 75% of a number is added to 75. then the result is the number itself .The number is
Solution:
Let,
The number be=x
75% of x + 75 = x
Or, 75/100*x +75=x
Or, 3x/4 + 75=x
Or, x=300
Answer:300

83.A rectangular field be fenced on three sides leaving a side of 20 feet uncovered.if the area of the field is 680 square feet .how many feet of fencing will be required?
Solution:
We know
Length * Breadth = Area

=> 20 * Breadth = 680

=> Breadth = 34 feet

Area to be fenced
= 2B + L
= 2*34 + 20
= 88 feet
Answer:88 feet
84. Two pipes A and B can fill a cistern in 12 minutes and 15 minutes respectively while a third pipe C can empty the full tank in 6 minutes .A and B are kept open for 5 minutes in the beginning and then C is also open. In what time is the cistern emptied -
Solution:
Part filled in 5 min
= 5 * (1/12 + 1/15)
= 5 * 9/60
= 3/4
Part emptied in 1 min when all the pipes are opened
= 1/6 - (1/12 + 1/15)
= 1/60
Now,
1/60 part is emptied in 1min
3/4 part will be emptied in
(60 * 3/4)= 45 min
Answer:45 minutes

85.The least number which is a perfect square and is divisible by each of the number is 16,20 and 24 is-
Solution:
LCM of 16,20,24 is =240
Factors of 240 are
=2*2*2*2*3*5
Hence to make 240 a perfect square we need to multiply by 5×3 as they are not in pair.
=240×5×3
=240×5×3
=3600(Answer)

86. X can do a piece of work in 40 days he works at it for 8 days and then Y finished it in 16 days. How long will they take together take to complete the work
Solution:
Work done by X in 8 days
=(1/40*8)
=1/5
Remaining work
=(1-1/5)
=4/5 portion
Now,
4/5 portion work is done by Y in 16

Whole work Y done
=(16*5/4)
=20 days
Both X & Y 1 days work
=(1/40 + 1/20)
=3/40
Hence, X and Y will together complete in=40/3 or 13.33 days
Answer:13.33 days

87. In a 300 m race A beats B by 22.5 metre or 6 seconds. B's time over the course is
Solution:
B runs 22.5 m in 6 seconds
B runs 300 m in (6×300)/22.5
= 80 seconds
B's time over the course = 80 seconds
Answer:80 second

88. A,B,C started business with their investment in the ratio 1:3 :5 .After 4 month A invested the same amount as before and B as well as C withdrew half of their investment .The ratio of their profit at the end of the year is-
Solution:
Let
Their initial investments be x, 3x and 5x respectively
Then
A:B:C
=(x*4+2x*8):(3x*4+3x/2*8):(5x*4+5x/2*8)
=20x:24x:40x
=5:6:10(Answer)

89:A gas tank is 1/5 full and requires 32 gallons to make it 3/7 th full.What is the capacity of the tank ?
Solution:
Let,
Capacity of the tank is=x gallons
According to the question,
3x/7-x/5=32
Or, (15x-7x)/35=32
Or,8x=32*35
Or, x=140
Answer:140 gallons

90:On selling 17 balls at Tk720,there is a loss equal to the cost price of 5 balls .The cost price of a ball is
Solution:
Let,
The cost price of a ball is x Tk
The cost price of 17 balls=17 x Tk
The cost price of 5 balls =5x Tk
We know,
Loss =cost price-selling price
Or,5x=17x -720
Or, x=60 Tk
Answer:60 Tk

91:A and B can do a piece of work in 9 days,B and c in 12 days,A and C in 18 days.If all of them work together,then how much time will they take to finish the same work?
Solution:
A and B can do in 1 day=1/9 portion
B & C can do in 1 day =1/12 portion
C and A can do in 1 day=1/18 portion
2(A+B+C) can do in 1 day
=(1/9+1/12+1/18)
=9/36
=1/4
So,
(A+B+C) can do in 1 day=1/(4*2)
A ,B and C can do the whole work
=1/(1/8)
=8 days
Answer:8 days

92-:In a class 75% passed in English,60% in Mathematics and 25% failed in both the subjects.What percentage who passed in both subjects?
Solution:
MCQ Ways...
Total=All single-All both+None
100=75+60-Both passed+25
Or,Both subjects=60
Answer:60%
Note:সকল কিছু শতকরা দেওয়া থাকলে মোট ১০০ ধরতে হবে।

93:A person makes a profit of 10% on 25% of the quantity and a loss of 20% on the rest of the quantity.What is the gain or loss in percentage on the whole?
Solution:
Let,
100 quantity cost price 100 Tk
25% quantity=100*25%=25
Profit 10%=25+25 of 10%=27.5
75 quantity loss 20%
=75-75 of 20%
=60
Total selling=(60+27.5)=87.5
Loss=(100-87.5)=12.5%
Answer:12.5% loss

94:Increasing the original price of an item by 10% the decreasing by 20% and then again increasing the price by 10% is equivalent to
Solution:
Let,
Original price=100 Tk
10% increase=110 Tk
20% decrease=(110-110*20%)
=88 Tk
Again,
10% increase =(88+88 of 10%)
=96.8 Tk
Decreasing=(100-96.8)=3.2%
Answer:3.2% decrease

95:A family had provision of food for 15 days.After 5 days 8 guests came and the provision lasted 6 days.How many are the members the family
Solution:
Suppose,
The number of members in the family=x
X person can consume in 15 days
=1 portion provision
1 person can consume in 1 day
=1/15x portion
According to the question,
5x/15x+6(x+8)/15x=1
Or, x =12
Answer:12

96:A train 150 m long and running at a speed of 60 km per hour takes 30 seconds to cross a bridge.What is a length of the bridge?
Solution:
Let,
Length of bridge=x m
Speed of train
=60*(5/18)
=50/3 mps
We know,
Distance=speed*time
Or, 150+x=60*(50*3)
Or, x=350

103:A dishonest shopkeeper professes to sell ghee at his cost price.But he uses a false weight of 950 g for a kg .His gain percentage is
Solution:
Gain percentage
=[(1000-950)/950*100]
=5.26%
Answer:5.26%

97:A sum of money at simple internet amounts to Tk 2800 in 2 years and to Tk 3250 in 5 years at a rate of
Solution:
Principal+5 years interest=3250 Tk
Principal+2 years interest=2800 Tk
---
3 years interest=450 Tk
1 ----------=150
2----------=150*2=300 Tk
Principal=(2800-300)=2500 Tk
Rate of interest
=[(150/2500)*100]%
=6%
Answer:6%

98:A dog takes 4 leaps for every 5 leaps of a hare but 3 leaps of the dog is equal to 4 leaps of the hare.Compare their speeds
Solution:
According to the question,
Dog 3 leaps is equal to 4 leaps hare
Dog 4 leaps is equal to
=(4*4)/3=16/3
Ratio of their speed

=16/3:5
=16:15
Answer:16:15

99:In a mixture of liters milk and water are in the ratio of 3:2.How much water would be added to the mixture to make the two equal?
Solution:
Milk in the mixture
=50*(3/3+2)
=30 liters
Water in the mixture
=(50-30)
=20 liters
Suppose,
X water liter would be added to the mixture to make half water & half milk
30:(20+x)=1/2:1/2

Or, x=10
Answer:10 liters

100:A room of size 5m *3m and height 3m requires walls and celiing painting.what is the area to be painted?
Solution:
Total area of painted
=The ceiling+ four walls
=length*breadth+2[L+b]h
=5*3+2[5+3]*3
=63 square m
Answer:63 s

101.A, B, C can complete a work in 12, 15 and 25 days respectively. A and B started working together where as C worked with them in every third day. Find the number of days required to complete the work?

Solution:
Total work be 300 units [LCM of 12,15,25]
1 day work or efficiency of A:B:C=25:20:12
Work anatomy :
(A+B)+(A+B)+(A+B+C)
(25+20)+(25+20)+(25+20+12) => 147 units done in 3 days
So, 294 units done in 6 days.Remaining 300-294=6 units can be done by (A+B) in (6/45) = (2/15) days
So, Total=6(2/15) days Answer: 6(2/15) days

102.In a 3600 m race around a circular track of length 400m, the faster runner and the slowest runner meet at the end of the fourth minute, for the first time after the start of the race. All the runners maintain uniform speed throughout the race. If the faster runner runs at thrice the speed of the slowest runner. Find the time taken by the faster runner to finish the race.
Solution:
Suppose,
slower ones speed x m per minute
so, faster ones 3x m per minute
as after 4 minutes, faster run more 400 m than slower. so the equation is
3x*4 - x*4= 400
x= 50
so,
in 4 minutes slower one run 50*4= 200 m.
in 4 minutes faster one run 3*50*4= 600 m.
so, faster one need 3600/(600/4)= 24 minutes to complete the race

Alternative:
Smart way.....
Speed ratio => 3:1
Since time is same when both meet first time,
Then Distance is directly proportional to Time.
Here, 3-1 = 2
So, 2 is equivalent to 400 m
Then, 3 is equivalent to 600 m
That means, Faster one travels 600 m in 4 min
So, Faster one travels 3600 m in 3600*4/600 = 24 min

Alternative:

As, the faster runner is thrice as fast as the slowest runner, the faster runner would have completed three rounds by the time the slowest runner completes one round.

And that is their second meeting.

Their first meeting takes place after the fastest runner takes 4 min to complete one and the half round.

400*3/2=600 meter

He takes=(3600*4)/600=24 minutes to finish the race.

Alternative:
Let,
Speed of slower runner
=x m/mins
Speed of the faster runner=3x m/mins
Relative speed
=2x m/mins
Now,

Distance=velocity*time
=2x*4
=8x meters
According to the question,
8x=400
x=50 m/mins
Speed for faster runner
=3*50
=150 m/mins
So, Time taken by faster runner to complete the race will be
= distance/velocity
= 3600/150
=24 mins
Answer:24 minutes

103.A compact cube of 50 cm side was kept in a cistern of having dimension of 3 m length, 2 m breadth & 1m height . If the cube were put aside from the cistern after filling up the cistern full to to the brink, what would be the height of water level from bottom?
solution:
Given that,
Length of cistern= 3m= 300 cm
Breadth of cistern= 2m =200 cm
And Height of cistern = 1m = 100 cm
So, Volume of the cistern
=(300*200*100) CC=600000 CC
Again, one side of the compact cube= 50 cm
so, volume of the compact cube
= $(50)^3$=125000 CC
After the removal of the cube the volumne of water in the cistern will become
=(6000000-1250000)=587500 CC

In this circumstances ,
Depth of water
=Volume of water/(Length*breadth)
= 587500/(300*200)
= 1175/12
= 97.92 cm
Answer: 97.92 cm

104.Fahim & Rishad both started at the same time from point A to point B at speeds of 52 kmph & 39 kmph respectively on the same road.As soon as Fahim reaches point B ,he turns back,starts toward point B,he turns back ,starts toward point A on the same road and meets Rishad on the way.how far from point B do the two of them meet,if the distance between the points is 70 km?
Solution:
{52(70 - x)}={39(70+x)}

Or,3640 - 52x = 2730 + 39x
Or,91x = 910
Or,x = 10 km

Answer:10 km

105.In an acoustics class, 120 students are male and 100 students are female. 25% of the male students and 20% of the female students are engineering students. 20% of the male engineering students and 25% of the female engineering students passed the final exam. What percentage of engineering students passed the exam
Solution:
Male students:
Given that,
Total=120
Male Engineering students
=(120*25)/100=30
Male engineering students passed
=30 of 20%=6
Female:
Total=100
Female engineering students
=100 of 20%=20
Female engineering students passed
=20 of 25%=5
Total students passed(Male+Female)
=30+20=50
Required engineering students passed percentage
=(11*100)/50=22%
Answer:22%

106.Two pipes A and B can fill a cistern in 37(1/2) minutes and 45 minutes respectively. Both pipes are opened. The cistern will be filled in just half an hour, if pipe B is turned off after.
Solution:
Let,
B turned off after x min
So, (A+B) fill the tank in x min and remaining time(30-x) fill by A only
According to the question,
{x(2/75+1/45)}+{(30-x)*2/75}=1
Or ,x=9
Hence, After 9 minutes B should be turned off then the cistern filled in just half an hour
Answer:9 Minutes

107.An employer pays 3 workersX,Y and Z a total of tk 36600 a week. X is paid 125% of the amount Y is paid and 80% of the amount Z is paid. How much does X make a week.
Solution:
Let,
z paid Tk.100
x is paid 80%of100= 80
Again,
x =125% Y
Or,(80*100)/125= y
Or Y=64
Now,
x+y+z=80+64+100=244
244% =36600 80%= (36600*80)/244=12000
Answer:12000

108.A can do a work in 20 days and B can do it in 25 days. They started together and after some times B left. Remaining work is finished in 15 days. Find how when B left the workplace?
Solution:
A 's 15 days work
=15/20=4/5 portion
Remaining work
=(1-3/4)=1/4 portion
Clearly,(A+B) both done 1/4 portion
Now, (A+B) ,1 day's work
=1/20+1/25
=9/100 portion
So,
1/4 portion (A+B)done
=(100*1)/9*4=25/9 day's
B left after 25/9 days
Answer:25/9 days
Alternative:
Total work be 100 units
[LCM of 20 & 25 is 100]
Efficiency of
A=100/20=5 units
B=100/25=4 units
According to the question,
{(A+B)*x}+{A*15}=100
=>9x+(5*15)=100
=>x=25/9 days

109. A circular wheel 28 inches in diameter rotates (moves) the same number of inches per second as a circular wheel 35 inches in diameter.If the smaller wheel makes x revolutions per second,how many revolutions per minute does the larger wheel make in terms of x ?
Solution:
As we know,
1 revolution of circle= Circumference of that circle.
Again,
Circumference of circle=2πr
Given that,
Diameter = 28 inches
So, radius, r= 28/2= 14 inches
Now, circumference = 28π inches
Hence,
x revolutions per sec = 28πx inches
Then in 60 sec 28πx*60 inches
ATQ;
28πx*60 = 35πn
=> n = 48x
Thus, the required no of revolutions is 48x
Answer:48x

110.A does half as much work as B in three fourth of the time.If together they take 18 days to complete a work, how much time shall B take to do it?
Solution:
Let,
B takes X days to finish 1 job,
then
A will take 3x/4 days to finish 0.5 job.
Now we know that
18(1/X + 0.5/0.75X)=1
Or,1/X + 50/75X = 1/18
Or,1/X (1 + 10/15) = 1/18
Or,X = 30
Answer:30

111. Water flows into an empty 64 gallons drum through pipe A and flows out through pipe B. If the rate of flow through A is 2 gallons per hr, how many gallons per hr must flow out through pipe B so that the drum is full in exactly 96 hrs?
Solution:
in 1 hr,A fill up = 2 gallon
in 96 hr,A fill up = 2*96 =192 gallon
the capacity of the drum = 64
So,
A fill up extra =192- 64=128 gallon

which actually B,flow out in 96 hr
In 96 hr,B flow out = 128 gallon
in 1 hr,B flow out =128/96=4/3= 1.33 gallon

Answer:1.33 gallon

112.A survey showed that 63% of Bengali people like chicken whereas 76% like fish.If X% like both fish & chicken then what is the range of X?
Solution:
Let
The people who like both be x% and the people who like none be n% of the total ;
Thus,63 people like chicken ,
76 people like fish,
'x' people like both and 'n' people like none.
Now, Poeple who like only chicken = (63 - x) ;
only fish = (76 - x).
Since total people = 100
According to the question,
(Only chicken)+(Only fish)+Both+ None=100.
Or, (63 - x)+(76 -x)+ x+n= 100.
Or, 139 -x + n = 100
Or x - n = 39
But x cannot exceed 63 since 63 people like chicken.
Hence, the range required
=39 ≤ x ≤ 63
Answer:39 ≤ x ≤ 63

113.A man & a boy together can complete a job in 81dys.Two man & three boys together can complete the job in 36dys.In how many days can 4 men working together complete the job?
Solution:
Let,
1 man's 1 day's work=x
& 1 boy's 1day's work=y
According to the question,
x+y=1/81.....(1)
2x+3y=1/36.....(2)
from 1 equation we get,
x=1/81-y.....(3)
Now,after adding the value of x in equation (2) we get,
2(1/81-y)+3y=1/36
=>y=1/324
so,from equation (3) we get,
x=1/81-1/324
=>x=1/108
Now,

1 man does 1/108 portion work in 1 day
4 men do 1portion in:::::::108/4=27 day's

Answer:27 days

114.In a mixture of 60litres the ratio of milk & water is 2:1.If this ratio is to be 1:2,then what is the quantity of water to be further added in the miixture?
Solution:
Given that,
Total amount of mixture=60 litres
From question condition,
Milk=40 ltrs & Water=20 ltrs
Suppose,
X ltr water would be added in the mixture.
According to the question,
40/20+x=1/2
=>20+x=80
=>X=60
So,60 litre water would be added into the mixture
Answer:60 litres

115.Before the budget,a businessman had increased the price of his product 12%. in the budget a 10% sale tax(to be paid by the seller) was imposed on that product.As a result the profit ultimately increased by Tk 64,what was the original selling price?
Solution:
Let,
Original price=100 TK
20%Increased price then new price=112 TK
After giving 10% sale tax, then
Selling price=112-112 of 10%=100.8 tk
Profit increased=100.8-100)=.8 TK
So,
Original selling price
={(64*100)/0.8}
=8000 tk
Answer:8000 TK

116. Ayisha's age is 1/6 of her fathers age. Ayishas fathers age will be twice the shankar's age after 10 years. If shankar's eighth birthday celebrate two years before,what is the present age of Ayisha?
Solution:
Let,
Ayisha's age be x
And Her father be 6x
From question condition,
Shanker=(6x+10)/2
=3x+5

According to the question,
3x+5=8+2+10
Or, x=5
Hence,Ayisha's age is 5 years
Answer:5 Years

117. A, B and C enter into a partnership. A initially invests Tk. 25 lakhs and adds another Tk. 10 lakhs after one year. B initially invests Tk. 35 lakhs and withdraws Tk. 10 lakhs after 2 years and C invests Tk. 30 lakhs.In what ratio should the profits be divided at the end of 3 years?
[Meghna Bank-MTO -2016]
Solution:
The profit should be divided according to the investment ratios
A: B: C= (25×1+35×2) :(35×2+25×1): (30×3)
= (25+70) : (70+25) : (90)
=95: 95 :90
=19:19:18
Ans: 19: 19 : 18

118. Abir can do a piece of work in 80 days. He works for 10 days and then Basher alone finishes the rest of the work in 42 days. How much time would it take for the two of them together to complete the whole work?
Solution:
Let, the whole work = 1 part
In 80 days, Abir can do 1 work
In 1 day,……..(1/80) portion
In 10 days……{(1×10)/80} portion
=1/8 portion
Rest of the work ={1–(1/8)}=7/8 portion
Now,
In 42 days, Bashir can do 7/8 portion
In 1 day, Bashir can do (7/8)×42 portion
=1/48 portion
In 1 day, Abir and Bashir together can do = (1/80+1/48) portion
= (3+5)/240
= 1/ 30 portion
So, they can do 1/30 part works in 1 day
They can do 1 part works in 30/1= 30 days
Answer:30 days

119. A man has to go 10 km to catch a bus. He walks part of the way at 7 km per hour runs the rest of the way at 12 km per hour. If he takes 1 hour 15 minutes to complete his journey. Find how far he walked?
Solution:
Let, he walks ‘x’ km and run (10-x) km.
According to the question,

(7/x)+(10-x)/12=75/60
Or, 20x + 280= 420
Or, 20x= 420- 280
Or, 20x= 140
x= 7
Hence,He walked 7 km.
Answer:7 km

120. In a school, there are equal number of boys and girls. Among the students, 1/8 of the girls and 5/6 of the boys are residing in the hostel. What percent of the Students consists of boys who do not reside in the hostel among all students?[Modhumoti Bank MTO-2016]
Solution:
Let, the number of boys be 'x' and girls be 'x'.
So, Total= 2x students.
Non residing boys
= x-5/6 of x= x- 5x/6=x/6
Required percentage=
(x/6/2x) × 100%
= 8.33%
Answer:8.33%
Alternative Method:
L.C.M. of 8 and 6= 48
Let, total student be 48
So, boys= 24 and girls= 24
Boys residing in the hostel =24×(5/6)= 20
Boys do not reside in the hostel =24-20= 4
Required percentage
= (4/48)×100 %
= 8.33 %

121.A bank has a parking plot of 70 parking spaces. Each row in the parking lot contains the same number of parking spaces. The bank has purchased additional land for expansion of the office space. When the expansion is made, two parking spaces will be lost from each row; however, 4 more rows will be added to the parking lot. After the expansion is made, the capacity of the parking lot will remain the same and each row will contain the same number of parking spaces.
Solution:
Let,
Each row contains x no of parking space
The no of row =70/x
After expansion,Each row contains
(x-2) no of parking space
After expansion each row no
=70/(x-2)
According to the question,

(70/x)+4=70/(x-2)
==========
Or,(x+5)(x-7)=0
So, x=7
The number of row =70/7=10
Answer:10

122. A machine P can print 1 lakh books in 8 hour, Q can same in 10 hour & R can print them in 12 hour. All the machine r started at 9 AM, while machine P in closed at 11 am and the remaining two machine complete the work. Approximately at what time the work will be finished?

Solution:
In 1 hour, (P + Q + R) work
= (1/8 + 1/10 + 1/12)
= 37/120 part
Work done by P, Q and R in 2 hours = (37 x 2)/120
= 37/60 part
Remaining work =(1 - 37/60)
= 23/60 part
In 1 hour, (Q + R) work
=(1/10+ 1/12)
= 11/60 part
Now, 11/60 part work is done by Q and R in 1 hour
So, 23/60 part work will be done by Q and R in
=(60*23)/(11*60
= 23/11 hours
=2 hours.
So, the work will be finished approximately after 2 hours around 1 P.M.

123.A picnic was arranged by 'm' students.Total cost of picnic was estimated to be 'y' Tk.Unfortunately, z students withdrew their names from the picnic.How many more tk would each of the remaining students have to pay?

Solution:
Given that,
Total student = m
&
Total cost of picnic was estimated to be= y tk
So Cost per student was = y/m Tk
Since z student withdrew their name from picnic,
Now remaining student=(m-z)
And
Nwe cost per student is = y/(m-z)

So, Extra cost needed for rest of the stds now = y/(m-z) -y/m
= yz/m(m-z)

Answer: yz/m(m-z)

124. A, B and C of them working alone can complete a job in 6,8,12 days respectively. If all three of them work together to complete a job and earn Tk. 2340 what will be C's shareSolution:
In 1 day,
A, B and C alone can do
1/6, 1/8 and 1/12 part of the work respectively
Ratio of their working rate
∴ A: B: C= 1/6:1/8:1/12
= 4:3:2 [Multiply by 24]
∴ Sum of the ratio= 4+3+2= 9
∴ C's share=Tk. (2340 × 2/9)
= Tk.520
Answer: Tk.520

125.Each person in a group of 110 investors has investments in either equities or securities or both. Exactly 25% of the investors in equities have investments in securities, and exactly 40% of the investors in securities have investments in equities.How many have investment in equities? **[GMAT]**

Solution:
The investors can be categorized into three groups:
(1) Those who have investments in equities only.
(2) Those who have investments in securities only.
(3) Those who have investments in both equities and securities.
Let ,
x, y, and z denote the number of people in the respective categories. Since the total number of investors is 110, we have
x + y + z = 110 ---------- (1)

Also,
The number of people with investments in equities is x + z
and
The number of people with investments in securities is y + z.
Since exactly 25% of the investors in equities have investments in securities, we have the equation
25% of (x+z)=z
x = 3z ---------- (2)

Since exactly 40% of the investors in securities have investments in equities, we have the equation
40% of (y+z)=z
y = {3z}/2 ---------- (3)

Substituting equations (2) and (3) into equation (1) yields
3z+(3z/2)+z=110
==========
Or, Z=20

Hence,
the number of people with investments in equities is:
=x+z
=3z+z
=3×20+20
=60+20
=80
Answer:80

126.Mr Rahman invested a certain sum of money in a bank that paid simple interest. The amount grew to tk. 240 at the end of 2 years. He waited for another 3 years and got a final amount of Tk. 300. What was the principal amount that he invested at the beginning?Solution:
Given that,
5 years interest+Principal=Tk.300
2 years interest+Principal=Tk.240

[Minus] 3 years interest =Tk.60
2 years interest =[(60*2)/3]
= Tk 40
Hence,
Principal =Tk.(240-40)=Tk.200
Answer:200 Tk

165.In a shop, the cost of 4 shirts, 4 pairs of trousers and 2 hats is Tk. 5600. The cost of 9 shirts, 9 pairs of trousers and 6 hats is Tk. 12900. What is the total cost of 1 shirt, 1 pair of trousers and 1 hat?

Solution:
Let,
The cost of a shirt is x Tk
A pair(Two) of trousers is y Tk
and a hat is z
According to the question,
4x+4y+2z = 5600 ---------- (i)

9x+9y+6z = 12900 ---------- (ii)
From (ii) no equation,
Or, 9x+9y+6z= 12600
Or, 3x +3y+2z =4300----------(iii)

(i) no equation--(ii) no equation=>
4x + 4y + 2z =5600
3x + 3y + 2z =4300

Or, x + y =1300 ---------(iv)
(I) --(ii)*4 =
4x + 4y + 2z=5600
4x +4y. =1300*4

Or , 2 z =400
Or, z =200

So, x+y+z = 1300+200 = 1500
And Total cost of 1 shirt, 1 pair of trousers and 1 hat is Tk. 1500.

Answer: Tk. 1500

127.Mr. X borrowed Tk. 500 at 5% simple interest per year. After some time, he borrowed Tk. 400 at 3.5% simple interest per year for the second time. Six months after the second time borrowing, he repaid both the borrowed money along with interest and the amount repaid was Tk. 994.50. How many years after the first time borrowing Mr. X repaid the borrowed money?[KSB SO-2013][23th BCS WRITTEN]
Solution:
Total amount=(400+500)=900 Tk
Total interest=(994.5-900)=94.5 Tk

3.5% interest rate
400 Tk 1/2 years interest
=[(7*400)/(2*100*2)]
= 7 Tk.

Remaining interest=(94.5-7)=87.5 Tk
5% rate of interest
500 Tk 1 years interest
=(5*500/100)=25 Tk

25 Tk interest for 1 years
87.5 Tk interest(87.5/25)=3.5 years

So after 3.5 years then he took second amount
Answer:3.5 years

128.Rahim can do a piece of work in 80 days.Rahim works for 10 days and Karim alone finishes the rest of the work in 42 days.How much time would it take for the two of them together to complete the whole work?
Solution:
Let,
.
Total portion work=1
Rahim 80 days done=1 portion
Rahim 10 days done=(10/80)=1/8 portion
Remaining work=(1-1/8)
=7/8 portion
Karim 7/8 portion done=42 days
Karim 1 or full portion work done
=(42*8/7)=48 days
Both Rahim & Karim 1 day done
=(1/80+1/48) portion
=1/30 portion
Both
1/30 portion done=1 days
Full work done=(1*30)/1=30 days
Answer:30 days

128.The length of a rectangle field is 1.5 times of width.An amount of Tk 10,260 was needed to cover the field with grass at the rate of 1.9 Tk per square meter.How much would it cost to fence the four sides of the rectangular field at the rate of Tk 2.5 per meter?[Board Book]

Solution:
Area of the rectangle
=(10260/1.9)
=5400 square meter
Let,
Width of the rectangle=x meter

Length of rectangle=(3x/2) meter
We know,
(3x/2)*x=5400
Or, x=60
And
Length=(3*60/2)=90 meter
Perimeter of rectangle
=2[90+60]

=300 meter
So total Tk needed around rectangle fence=(300*2.5)=750 Tk
Answer:750 Tk

129.A, B, C can complete a piece of work in 16, 32, 48 days respectively.They started working together but C left after working 4 days and B left 2 days before the completion of the work.How many days require to complete the work?[GMAT]
Solution-1:
Let,
Total time taken to complete the whole work is x days
According to the question,
x/16+(x-2)/32+(4/48)=1
Or,6x+3x-6+8=96
Or,9x=94/9
Answer:94/9 or 10.44 days

Alternative:
Suppose,
Total work be 96 units
[LCM of 26,32 & 48 is 96]
Efficiency of work rate per day of A,B & C is
A= 96/16=6 units
B= 96/32=3 units
C=96/48=2 units
Worked done by A,B,C in 4 days
= {(6+3+3)*4}=44 units
Worked done by A in 2 days
= 2*6= 12 units
Remaining work
= 96-(44+12)
=40 units
A & B 1 day done=(6+3)=9 units
Remaining worked done by A & B
= 40/9
Total days required to finish the whole work={4+2+(40/9)}=10(4/9) days

Answer:10.44 days

130.There are 87 balls in a jar.Each ball is painted with at least one of two colors,red or green.It is observed that 2/7 of the ball that have red colors also have green color,while 3/7 of the balls that have green color also have red color.What fraction of the balls in the jar has both red and green colors?[UCB PO-2017][DBBL PO-2016]
{Important for Written}
Solution:
Suppose,
Only Red painted=R
Only Green painted=G
Both Red & Green painted=X
So,
R+G+X = 87----------(1)
Also,
Red painted=(R+X)
Green painted=(G+X)
So,
(R+X)*2/7=X
Or, R =5x/2----------(2)
And,
(G+X)*3/7=X
Or, G =4x/7----------(3)
From equations(1)
R+G+X =87
Or, (5x/2)+(4x/3)+x =87
Or, x =18
Required fraction
=18/87
=6/29
Answer:6/29

131.A,B and C started a business by investing the amount of Tk 600 ,Tk 800 and Tk 900 respectively.After few months,A invested an amount of Tk 300 in the same business.At the end of the year,they profited of Tk 300.After how many months did A invest Tk 300 if C's share of profits be Tk 108 ?[Cotton Development Board-1997]
Solution:
Let,
For x month A invest 300 tk.
So,
Investment of A ,B & C
{(600*12)+300*X} : 800*12 : 900*12
=(24+x):32:36
Sum of Ratio
=24+X+32+36
=92+x

C' share
300*36/(92+x)=108
Or, x=8

A invest Tk 300 for 8 months
SO,
A invest 300 tk after
(12-8)=4 months
Answer: 4 months

132. A sum of money is borrowed and paid back in two annual installments of TK.882 each allowing 5% compound interest .The sum borrowed was [JBL EO MCQ-2017]
{Important for Written}
Solution:
Let,
The sum is =x tk
In first years compound
882=x(1+5/100)^1
Or,882=21x/20
Or,x=840
Second year,
Amount=(840+882)=1722 tk
Second year compunted,
1722=x(1+5/100)^1
Or,1722=21x/20
Or,x=1640
The sum borrowed was=1640 tk
Answer:1640 tk

133.It takes 120 metric tone water to sink a ship.Through a hole in the full of the ship,water is entering the ship at a rate of 2 metric tone per minute. At the same time,water is being pumped out at the rate 1.5 metric tone per minute using one pump. After 1 hour and 20 minutes another pump of same capacity was started. How much more time will it take to pump all the water out of the ship?
Solution:
Here,
Water enter ship per minute
=2 metric tone
Water pumped out per minute
=1.5 metric tone
Water entered more per minute
=(2-1.5)=.5 metric tone
**After 1 hr & 20 minutes or 80 minutes
Water poured =(80*.5)=40 MT

After 80 minutes another capacity
pumped out pump started
So two pump pumped out water per minute=(1.5+1.5)=3 metric. tones
And 1 minute more water
pumped out=(3-2)=1 metric tone
Now,
1MT pumped out =1 minute
40 «»«»«»«»«»«»«»«=(40*1)/1
=40 minutes
Answer:40 minutes

134.Twenty-four men can complete a work in sixteen days.Thirty-two women can complete the same work in twenty-four days. Sixteen men and sixteen women started working for twelve days. How many more men are to be added to complete the work remaining work in 2 days?
Solution:
Here,
24 men can complete in 16 days 1 portion work
1 man can complete in 1 day=1/(16*24)
=1/384 portion
Again,
32 women can complete in 24 days 1 portion
1 woman can complete in 1 day=1(32*24)
=1/768 portion
Both,
1man +1 woman work in 1 day=(1/384+1/768)
16 men +16 women work 12 days
=[(16*12)/384 + (16*12)/768] portion
=(1/2+1/4) portion
=3/4 portion

Remaining work
=1-3/4
=1/4 portion
Let,
X more men should be added then the remaining work complete in 2 days
Total men =(16+x)
1 man in 1 day done=1/384 portion
(16+x) men in 2 days done=(16+x)*2/384 portion

Similarly,
16 women in 2 days done=(16*2)/768 portion

According to the question,
(16+x)*2/384 +32/768=1/4

Or,(32+2x)/384=1/4-32/768
Or,(32+2x)/384=(192-32)/768
Or,(32+2x)/384=160/768
Or, 32+2x=160/2
Or,2x=80-32
Or,2x=48
Or, x=24
Answer:24 men

135.The average speed of Train in the onward Journey is 25% more than that is the return journey .The train halts for an hours on reaching the destination. The total time taken for the complete journey to and fro17 hours, covering a distance of 800 km. Find the speed of the Train is the onward journe?
Solution:
Let,
Return speed of the train is x kmh
So,
Onward speed of the train be(x+x of 25%) =5x/4
The train halts for an hour
So,Actual time taken the train
(17-1)=16 hours

According to the question,
400/x + 400/(5x/4)=16
Or,400/x +400*4/5x=16
Or,(400*5+400*4)/5x=16
Or,x=(400*9)/(16*5)
Or, x=45

So, Onward speed of the train is =5x/4
=(5*45)/4
=56.25 kmh
Answer:56.25 km/h

136.A and B together can do a piece of work in 12 days, which B and C can do in 16 days. After A has been working at it for 5 days and B for 7days C finishes in 13 days. In how many days C alone will do the work?{Very Important Math}
Solution:
Work done by A & B in 1 day=1/12
Work done by B & C in 1 day=1/16
Let,
Work done by C in 1 day=x
From question,
Work done by A in 5 days+ B in 7 days+ C in 13 days=1

So,
(A+B)'s 5 days work+(B+C)'s 2 days work + C's 11x days work=1
[See Picture Combination work]
Or, (5/12)+(2/16)+11x=1
Or, x =1/24
So, C alone can finish the work it in 24 days
Answer:24 days

137.Two outlets of a motor manufacturing company reported that revenue from outlet X in 2013 was down 11 percent from 2012 and revenue from outlet Y in 2013 were up 7 percent from 2012. If total revenue from outlet X and Y in 2013 was up 1 percent from 2012, what is the ratio of revenue from outlet X in 2012 from outlet Y in 2012?[Jamuna Bank PO-2014]
Solution:
Let,
In 2012, X & Y outlets income was 100x & 100 y
Total Revenue of X & Y outlets in 2012 was
=100X +100Y
=100(X+Y)
In 2013, X outlets income down 11%
So, X outlets net income in 2013 was
=(100-11)X
=89X
In 2013,Y outlets income were up 7%
So, Y outlets net income in 2013 was
=(100+7)Y
=107Y
In 2013, X and Y outlets total revenue was
=(89X+107Y)
But,
2013 total revenue increased 1% from 2012 total revenue
=100(X+Y)+100(X+Y) of 1%
=101X +101Y
According to the question,
101X +101Y=89X+107Y

Or, X:Y=1:2
Answer:1:2

138.A part time employee whose hourly wage was increased by 25 percent decided to reduce the number of hours worked per week so that the employees total weekly income would remain unchanged.By what percent should the number of hours work be reduced?
[ICB SO-2011]
Solution:
Let,

The Hourly wage =W
Initially working hours=H
Reduced working hour=H1
According to the question,
H*W =25% of W*H1
Or, H=1.25 H1
Or, H1=0.8H
The number of hours that should be reduced
={(1-0.8)/1}*100
=20%
And:20%
Solution-2:
Let,
Original hourly wages=10
Original working hours =10
Total wage the employee income before change his wage & Working time
=(10*10)
=100
New hourly wages
=10 +10 of 25%
=12.5
Reducing working hours=H
According to the question,
H*12.5=100
Or, H=8
So,
Working hour reduce
=10-8
=2
Required hours reduced
=(2/10)*100
=20%
Answer:20%

139.Four person each of home work at the same rate where to complete job according to a schedule. However because of an agreement, two of them four quit after working one day.The remaining person finished the job, but it required two more days, that what had originally been scheduled.How many days were originally scheduled for completion of the job ?[DBBL-PO-2003]
Solution:
Let,
Originally time taken=X days
4 Men 1 day's work=1/X portion
Remaining work

=(1-1/X)
={(X-1)/X } portion
Remaining person=4-2=2
Remaining days
=(X-1+2)
=(X+1) days
1 man 1 day's work=1/4X
2 men (X+1) days work
=(X+1)/2X
According to the question,
(X+1)/2X={(X-1)/X}
Or, X=3
Schedule time originally was 3 days
And: 3 days

140.Movenpick's ice-cream cones are of 12 cm in diameter and 18 cm height.To cope with the price hike of the ingredients,the management planned to reduce the quality of ice-cream per cone by adjusting the cone diameter and/or height.If they reduce diameter by 2 cm while maintaining the height,how much ice-cream can they save per cone.[FSIBL PO-2016 MCQ]
Solution:
Give that,
Initial diameter of ice-cream=12 cm
So, Radius of ice-cream
R=12/2=6 cm
After 2 cm reduce diameter then new diameter=(12-2)=10 cm
New Radius r=10/2=5 cm
Total Ice-cream saved
=Initial Volume - Final Volume
$=1/3\ \pi(R^2)h - 1/3\ \pi r^2h$
$=6\pi*(36 - 25)$
$=66\ \pi$
Answer:66π
নোট:
যেহেতু আইসক্রিম কোণক আকৃতির
তাই মোট আয়তন=১/৩ $\pi r^২h$
এর সূত্র হয়েছে

141:In first 1000 natural numbers,how many integers exist such that they leave a reminder 4 when divided by 7 and a reminder 9 when divided by 11?
[BHBFC SO-2017][DBBL-SO-2017][GMAT]
Solution:
Let,
Integer be X & Quotient be q

When integer X is divided by 7 , it leaves a remainder of 4
X=7q +4
X can take values 4 , 11 , 18 , 25 , 32 , 39 , 46 , 53 , 60
When integer X is divided by 11 , it leaves a remainder of 9
X= 11p + 9
X can take values 9 , 20 , 31 , 42 , 53 , 64
The first integer which fulfills the given criteria is 53 .
Similarly,we will get the next such after an interval of LCM of 7 and 11,that is 77
The numbers are
53 ,
53+77*1=130
53+77*2=207
53+77*3=284

==========
77*12 + 53=977

Number of such integers
= {(977-53)/77}+1
=13
Ans:13

142.A sum of Rs. 725 is lent in the beginning of a year at a certain rate of interest. After 8 months, a sum of Rs. 362.50 more is lent but at the rate twice the former. At the end of the year, Rs. 33.50 is earned as interest from both the loans. What was the original rate of interest? [GMAT]

Solution:
Let,
Original rate =X
After 8 months rate=2X
According to the question,
{(725*x*1)/100}+{(362.50*2x*4/12)/100}=33.50
X=3.46%
So, the original rate is 3.46%
Answer:3.46%

14379.A financier claims to be lending money at simple interest, But he includes the interest every six months for calculating the principal. If he is charging an interest of 10%, the effective rate of interest becomes
Solution:
Let,
Lending money Tk. 100
Interest for 1st 6 months

=100*1/2*10%
=5 tk
Next 6 month balance=105 tk
Interest for the next 6 months=105*1/2*10%=5.25

So,
Effective interest rate
=(5+5.25)=10.25%
Answer:10.25%

144.A does a work in 45 days whereas B does the same work in 36 days. A starts the work and was joined by B after 18 days. If A gets total 2350 as his wage, find the money B will get?
Solution:
Traditional way/Exam Approach:
A's 18 day's work=18/45=2/5
Both (A+B)'s 1 day work
=(1/45)+(1/36)
=1/20 portion
Both Full work done
=(1*20*3)/5
=12 days
A 12 days work
=12/45=4/15 portion
B's12 days work
=12/36
=1/3
Ratio of work A & B
=(2/5 +4/15):1/3
=2:1
So,
2 portion work for paid =2350 tk
1 portion paid for
=(2350/2)=1175 tk
So, B will get =1175 tk
Answer:1175 tk
Smart or Faster method:
Let,
Total work is 180 units
[LCM of 45 & 36]
A's working efficiency per day
=180/45
=4 units
B's working efficiency per day
=180/36

=5 units
A's 18 day work done
=18*4=72 units
Remaining work
=(180-72)
=108 units
A & B 1 day done=(4+5)=9 unit
A & B 108 unit done
=108/9=12 days
A 12 days done=12*4=48 unit
B ---------:------------=12*5=60 unit
A & B working portion ratio
=(72+48):60
=120:60
=2:1
So, B's got =2350/2
=Tk.1175
Answer:1175 tk

145.Two trains A and B start from X and Y towards Y and Xrespectively. After passing each other,they take 4 hours 48 minutes and 3 hours 20 minutes to reach Y and X respectively.If train is moving at 45 km/hr, then speed train B is?{Very Important}
Solution:
Let,
Speed of B train=Z
Give that,
4 hrs 48 m=24/5 hrs
3 hrs 20 m=10/3 hrs
After they meet the first train travelled=(45*24/5)=216 km
[Formula:Distance=Time*Speed]
And
Second train travelled
=Z*10/3
=10Z/3 km
::
Now,Before they meet second train travelled/cover the distance 216 km with speed Z km/h and First train cover 10Z/3 km with the speed 45 km/h
::
According to the question,
216/Z ={(10Z/3)/45}
Or, 216/Z=10Z/45*3
Or, 10*Z^2=45*3*216
Or, Z^2=2916
Or, Z=54

The speed of the second train is 54 km/h
Answer:54 km/h

146:While out on picnic,a group of boys came upon an apple tree.One of the boys climbed up tree and picked enough apples for each boy to have three,with none left over,the along with came three boys,making it impossible to divide the picked apples evenly. However, after picking one more apple and adding it to the total, every boy had two apples with none left over.How many apples were finally divided ?
Solution:
Let,
The total boys were in the picnic=X
and
Picked up total apples from tree=Y
Form first condition,
Y/X =3 ---------(1)
Second condition,
(Y+1)/(X+3)=2 ----------(2)

From equation no (1)=»
Y=3X-------(3)
Putting the value Y=3X in equation (2)
we get X=5
From equation(3)=»
Y=15
Hence,The total apples picked up from the tree 15
But (15+1)=16 apples were distributed among the boys then every boys got Two apple
Answer:16

147.A pipe can fill up an empty tank in 12 minutes. Another pipe flows out 14 litre per minute. If the two pipes are opened together and the empty tank is filled up in 96 minutes, how much water does the tank contain??

Let,
Water flow out x litre per minuter and
Total Water contains y litre in tank
This,
From Question condition,
y=12x.....(1)
Again when opened two pipe in the same time then the tank fill it in 96 mintues...
So,
y= 96x - 96*14.....(2)
From equation (I) and (ii) we get
96x - 96*14=12x

or, 84x=96*14
or, x=16
Putting the value in equation (I) we get,
y=12*16=192

The tank contains 192 litres of water
Ans:192 litres

148.একজন মাঝি দাঁড় বেয় ১৫ কিমি যেতে এবং ফিরতে ৪ ঘন্টা সময় ব্যয় করে। অনুকুলে ৫ কি.মি যতক্ষনে যায় প্রতিকূলে ৩ কি.মি যায়। নৌকার বেগ ও স্রোতের বেগ নির্নয় করুন।
Solution:
Suppose,
The downstream speed = d kmp
and the upstream speed= u kmp.
According to the question,
(15/d)+(15/u)=4.....(i)
And
5/d=3/u
or, 3d=5u
or, d=5u/3.....(ii)
From equation(i)=»
15/(5u/3)+15/u=4
or,15*3/5u+15/u=4
or,9/u+15/u=4
or,24/u=4
so u=24/4=6 kmp
so d=5*6/3=10 kmp
now
speed of boat= x and speed of Current= y
x+y=10
x-y=6
.....
2x=16
Or, x=8 km/hr
And, y=10-8=2 km/hr
Answer: 8 km/hr and 2 km/hr

149. দুই অংক বিশিষ্ট একটি সংখ্যা তার অংকদয়ের যোগফলের ৩ গুন। সংখ্যাটিকে ৩ দিয়ে গুণ করলে গুণফল অংক দুটির যোগফলের বর্গের সমান হয়। সংখ্যাটি কত

solution :
Let,
Unit place=y
Tenth place=x

So, the number=10x+y
According to the question,
10x+y=3(x+y)
Or,10x+y=3x+3y
Or,7x=2y
Or,x=2y/7.....(1)
Again,
3(10x+y)=(x+y)^2
=> 30x+3y=(x+y)^2
=>30*2y/7+3y=(2y/7+y)^2
=> 81y/7=81y^2/49
=> y=7
From equation(1)=»
X=(2*7)/7=2
so, the number=10*2+7=27
Answer:27

150:৩০% ছাড়ে বিক্রয় করায় ১৬% লোকসান হলো। ১০% ছাড়ে বিক্রয় করলে কত শতাংশ লাভ বা ক্ষতি হত?

Solution:
Let,
Cost price be 100 TK
30% loss selling price be 70 tk
So,the cost price
={(70*100)/84}=250/3 tk
10% discount selling price =90 TK
Hence,Profit={90-(250/3)}
= 20/3 TK
Required percentage
={(3*20*100)/3*250}=8%
Answer:8%

151. একজন লোক ৫% হার সুদে ৫০০ টাকা ধার করল এবং কিছুকাল পরে ৩.৫%হার সুদে আরও ৪০০টাকা ধার করেন। ২য় ধার নেয়ার ৬মাস পর তিনি উভয় ধার সুদে-মূলে ৯৯৪.৫০টাকায় শোধ করেন। প্রথম ধার নেয়ার কতদিন পর তিনি ঐ ধার শোধ করেন?

[23th BCS Written][KSB SO-2013]

Solution:
Total amount=(400+500)=900 Tk
Total interest=(994.5-900)=94.5 Tk

3.5% interest rate
400 Tk 1/2 years interest
=[(7*400)/(2*100*2)]
= 7 Tk.

Remaining interest=(94.5-7)=87.5 Tk

5% rate of interest
500 Tk 1 years interest
=(5*500/100)=25 Tk

25 Tk interest for 1 years
87.5 Tk interest(87.5/25)=3.5 years

So after 3.5 years then he took second amount
Answer:3.5 years

152.এক ব্যক্তি ৪০ দিনে তার দালানের কাজ শেষ করার জন্য ২৫ জন লোক নিয়োগ দিলেন।২০ দিন পর তিনি আরো ১৫ জন লোক নিয়োগ দিলেন এবং কাজটি ৫ দিন আগে শেষ হয়ে গেল।অতিরিক্ত লোক নিয়োগ না দিলে তিনি নির্ধারিত সময়ের কতদিন পরে কাজটি শেষ করতেন?[BADC(AO)2017]

Solution:
25 Men 40 days done 1 portion W
25 Men 20 days done 20/40«»«»«
=1/2 portion
Remaining work=(1-1/2)
=1/2 portion
Remaining days=(40-20-5)=15 days
Total worker=(25+15)=40
40 worker 1/2 portion done 15 day
1========1/2========== 15*40
25======1/2=========(15*40/25)=24 days
If he had not engaged the additional men,Then he needed
(24-20)=4 days more to finish the whole work in stipulated time
Answer: 4 days
Alternative:
Let,
x day needed to completed the whole work.
Total target day = 40 d
Man = 25
After 20 days,
Days left = 40-20 = 20 d
& number of M = 25+15 = 40
Now, task will be completed before 5 days,means = (40-5) = 35 days
According to the question,
25x = 20*25 + 15*40
Or,x =44
So, Additional day=(44-40)=4 days
Ans:4 days

153.একজন ব্যক্তি একটি বর্গক্ষেত্র জুড়ে আড়াআড়ি ভাবে হেটে গিয়েছিল।।প্রান্ত বরাবর না হাটার কারণে কত শতাংশ কম হাটতে হয়েছিল?[BADC(AO)2017]

Let,
Side of the square=1 unit
And Perimeter=4 unit
Half-perimeter=2
Accordingly,
The man walks diagonally,
diagonal=√(1+1)
=√2
=1.414
Save walking
=2-1.414
=0.586
Required%
=(0.586*100)/2
=29.3%
Answer:29.3%

154.ক ১ টি কাজ ২০ দিনে এবং খ সেই কাজ ৩০ দিনে করতে পারে। দুজন একত্রে কাজ শেষ করার ৫ দিন আগে খ চলে যায়,অবশিষ্ট কাজ কত সময়ে শেষ হবে?

Solution:
Suppose,
Total work be 60 unit
(LCM of 20 & 30=60)
Efficiency of A=3 unit per day
Efficiency of B=2 unit per day
Since B left 5 days before in completion.
A's work done in 5 day=3*5
=15 units
Remaining units
=60-15
=45 units
So,45 unit Done by A & B needed day
=45/5
=9 days
Hence,total time taken to complete the work be 14 days
Answer:14 days

155. ক ১ টি কাজ ৪০ দিনে এবং খ সেই কাজ ২০ দিনে করতে পারে। দুজন একত্রে কাজ করার ৬ দিন পর খ চলে যায়,অবশিষ্ট কাজ ক কত সময়ে শেষ করবে?

Solution:
Suppose,
Total work is 1 portion

(A+B)'s 6 days work
= (6/40+6/20)
= 9/20 portion
Rest of the work
={1-(9/20)}
=11/20 portion
Now,
A's
1/40 portion is done in 1 day
11/20 p is done in 40*11/20
= 22 days
Ans: 22 day

156. When a producer allows 36% commission on the retail price of this product, he earns a profit of 8.8% what would be his profit percent if the commission is reduced by 24%.
Solution:
Let,
The selling price is= x
Commission 36% thus net selling price=0.64x
Thus cost price is
=0.64x/1.088= .588x
Commission is reduced by 24% means new commission is
(36-24)=12%
New net selling price is=0.88x
thus profit percentage is
=(0.88x/.588)*100=49.6%
Thus profit percentage is 49.6%
Answer:49.6%

157. Sterling silver is 92.5% pure silver. How many grams of sterling silver must be mixed to a 90% silver alloy to obtain a 500 g of a 91% silver alloy?
Solution:
Let,
Amount of 92.5 silver will be “x” and
Amount of 90% silver will be “y”
Acoording to the question,
x + y = 500
or, y = 500 – x …… (1)
Now,
92.5%x + 90%y = 91% of 500
Or, 92.5x/100 + {90(500 – x)}/100 =45500/100
Or, 92.5x – 90x + 45000 = 45500
Or, 2.5x = 45500 – 45000 = 500

Or, x = 500/2.5 = 200
Answer:200

158.The total cost price of two watches is Tk. 840. One is sold at a profit of 16% and the other at a loss of 12%. There is no loss or gain in the whole transaction. The cost price of the watch on which the shopkeeper gains, is-
Solution:
Let,
Cost price of first watch is Tk x
So,
Cost price of Second watch
=Tk (840-x)
16% profits Selling price of first watch={(116*x)/100} Tk
12% loss SP of second watch
={88*(840-x)/100} Tk
According to the question,
(116x/100)+{(88*840-88x)/100}=840
or, (116x+ 73920-88x)/100=840
or, 28x+73920= 84000
or, 28x = 84000-73920
or, x= 100840/28
or, x= 360
Now, Cost price of first watch
= 360 Tk
C.p. of second = (840-x) = (840-360)= 480Tk.(answer
Alternative:
Let,
Cost price of first watch is tk.x
And cost price of second watch is tk(840-x)
According to the question,
16% of x = 12% of (840-x)
Or, 16x = 12*(840-x)
Or, 16x = 10080 -12x
Or, 28x = 10080
Or, x = 360
And cost price of other watch is
=(840-360)
=480 Tk
So , cost price of two watches are 360 & 480
Answer: 360 Tk ; 480 Tk

159. A and B can do a piece of work in 18 days, B and C can do it in 24 days, A and C can do it in 36 days. In how many days will A, B and C finishes it, working together and separately?
Solution:
(A + B)'s 1 day's work = 1/18
(B + C)'s 1 day's work = 1/24
(A + C)'s 1 day's work = 1/36

2(A + B + C)'s 1 day's work
=1/18 + 1/24 + 1/36=9/72
=1/8 portion of the work
(A +B + C)'s 1 day's work
=1/16 portion of the work

So,(A +B + C) together can finish the work in 16 days.

A's 1 day's work
=1/16 – 1/24
= 1/48 portion of the work
A alone can finish the work in 48 days.

B's 1 day's work
= 1/16 – 1/36
=5/144 portion of the work
B alone can finish the work in 144/5=28.8 days

C's 1 day work
=1/16-1/18
=1/144 portion of the work
C alone can finish the work in 144 days.

Ans: Together=16 days, A=48 days, B=28.8 days and C=144 days.

160.A alone can do a piece of work in 20 days, while B alone can do it in 30 days and C alone can do it in 60 days.If in every third day B in every fourth day C help A in doing the work ,how many days will be required to complete the whole work?
[34 & 32 th BCS Written Exam]

Solution:
Let,
Total work=1 portion

LCM of 3 & 4= 12

Per 12 days A work= 12 days
Per 12 days B work=(12/3)=4 days
Per 12 days C work=(12/4)=3 days

In 12 days, (A+B+C)'s work
=(12/20+4/30+3/60)
=47/60 part of the work

Remaining work
=(1-47/60)
=13/60 part of the work

[Every third day B help A in doing the work]
Again, in 3 days (A+B)'s work
=(3/20+1/30)
=11/60 part of the work

Remaining work
=(13/60-11/60)
=2/60=1/30 part of the work

On the16th day, (A+C)'s work =1/20+1/60=1/15 part of the work

1/15 part of work is done by (A+C) in 1 day
1/30 part of work is done by (A+C) in 15*(1/30)=1/2 day

Total Time taken to complete the whole work
=(12+3+1/2)
=15.5 days

Ans: 15.5 day

161.A number consists of three digits whose sum is 10.The middle digit is equal to the sum of the other two and the number will be increased by 99 if these two digit are reversed.What is the number?
[DBBL AO-2017]
Solution:
Let,
Unit digit = x
Tenth digit = y
&
Hundred digit = z
So, The original number
=100z+10y+x

1st condition,
x+y+z=10----------(1)
2nd condition,
y=x+z----------(2)
If unit digit & Hundred digit are interchanged their place the new number is =100x +10y +z
According to the question,
(100x +10y +z)-(100z+10y+x)=99
Or, z=x-1----------(3)
Putting the value of z in equation(2)
y= x+x-1
Or, y=2x -1----------(4)
again,
Putting the value of y and z in equation(1)
x+2x -1+x -1=10
Or, x=3
Now,putting the value of x in equation(4)
y=5

Putting the value of x & y in equation(1)
Z=2
Hence, the original Number is
= (100*2)+(10*5)+3=253 Answer:253

162.In a class, 120 students are finance major and 100 students are marketing major. 25% of finance and 20% of marketing students are male. 20% of male finance students and 25% of male marketing students pass the exam. What persent of male students pass the exam? [Union Bank MTO-2014]
Solution:
Finance major:
Given that,
Total=120
Male students
=(120*25)/100=30
Male students passed
=30 of 20%=6
Marketing major :
Total=100
Male students
=100 of 20%=20
male students passed
=20 of 25%=5
Total male students passed
=30+20=50

Required male students passed percentage
=(11*100)/50=22%
Answer:22%

163:The length of a rectangular field is 30 feet more than its width and the perimeter is 380 feet.What is the area of the field in square feet?
Solution:Let,
Width = x feet
Length = (x + 30) feet
According to question,
2{x + (x + 30)} = 380
or, 2x + 30 = 190
or, x = 160/2
or,x= 80
Now
Width = 80 feet
Length = (80 + 30) feet = 110 feet
So
Area of rectangle be
=110*80 = 8800 sq. feet
Answer :8800 sq.feet

164 :The length of a rectangular field is 30 feet more than its width and the perimeter is 380 feet. How much would it cost to cover the field with grass at the rate of 20 Tk per square feet?
Solution:Let,
Width = x feet
Length = (x + 30) feet
According to question,
2{x + (x + 30)} = 380
or, 2x + 30 = 190
or, x = 160/2
or,x= 80
Now
Width = 80 feet
Length = (80 + 30) feet =110 feet
So
Area of rectangle be
=110*80 = 8800 sq. feet
Cost to cover by grass
=8800*20
=1,76,000 Tk
Answer :176000 Tk

165:A borrower pays 6.5% interest per year on the first Tk 600, he borrowed and 7.25% per year on next part of the loan in excess of Tk 600.How much interest will the borrower pay on a loan of tk. 6500 for 1 year?
Solution:
Here,
Interest for the frist Tk 600
=[6.5*600]/100 =39Tk
Rest of the amount
=[6500 – 600]=5900 Tk
Interest for rest amount
=[7.25*5900]/100 = 427.75 Tk
Total interest = [427.75 + 39]
= 466.75 Tk
Answer :466.75 TK

166:A pipe can fill up an empty tank in 12 minutes. Another pipe flows out 14 litre per minute. If the two pipes are opened together and the empty tank is filled up in 96 minutes, how much water does the tank contain?
[Ministry of Defense-AD-2018]
Solution:
Let,
Water flow in x litre per minuter and
Total Water contains y litre in tank
This,From Question condition,
y=12x.....(1)
Again when opened two pipe in the same time then the tank fill it in 96 mintues...
So,
y= 96x - 96*14.....(2)
From equation (I) and (ii) we get
96x - 96*14=12x
or, 84x=96*14
or, x=16

Putting the value in equation (I) we get,
y=12*16=192
The tank contains 192 litres of water
Ans:192 litres

Set

Definition:
A set is a collection of objects.
It is usually represented in flower braces.
For example:
Set of natural numbers= {1,2,3,.....}
Set of whole numbers= {0,1,2,3,.....}

Each object is called an element of the set.

The set that contains all the elements of a given collection is called the universal set and is represented by the symbol 'μ', pronounced as 'mu'.

For two sets A and B,
n(A∪B) is the number of elements present in either of the sets A or B.
n(A∩B) is the number of elements present in both the sets A and B.
n(A∪B) = n(A) + (n(B) – n(A∩B)

For three sets A, B and C,

n(A∪B∪C)= n(A) + n(B) + n(C)– n(A∩B)–n(B∩C)–n(C∩A)+ n(A∩B∩C)

Consider the following example:
::
Question-01: In a class of 100 students, 35 like science and 45 like math. 10 like both. How many like either of them and how many like neither?
Solution:
Given that,
Total number of students,n(μ)=100
Number of science students,n(S)= 35
Number of math students, n(M)= 45

Number of students who like both, n(M∩S) = 10

Number of students who like either of them,

n(M∪S) = n(M) + n(S) – n(M∩S)
=45+35-10 = 70
Number of students who like neither = n(μ)–n(M∪S)=100–70=30

Answer:30

Question-02: There are 30 students in a class. Among them, 8 students are learning both English and French. A total of 18 students are learning English. If every student is learning at least one language, how many students are learning French in total?
Solution:
Every student is learning at least one language.
Hence there is no one who fall in the category 'neither'.

So in this case, n(E∪F) = n(μ).

It is mentioned in the problem that a total of 18 are learning English. This DOES NOT mean that 18 are learning ONLY English. Only when the word 'only' is mentioned in the problem should we consider it so.

Now, 18 are learning English and 8 are learning both. This means that 18 – 8 = 10 are learning ONLY English.

n(μ) = 30,
n(E) = 10
Now we can write,
n(E∪F) = n(E) + n(F) – n(E∩F)
Or,30 = 18+ n(F)–8
Or,n(F) = 20
Therefore, total number of students learning French = 20.
Answer:20
Question-03: Among a group of students, 50 played cricket, 50 played hockey and 40 played volley ball. 5 played both cricket and hockey, 10 played both hockey and volley ball, 5 played cricket and volley ball and 10 played all three. If every student played at least one game, find the number of students and how many played only cricket, only hockey and only volley ball?
Solution:
Given that,
n(C) = 50,
n(H) = 50,
n(V) = 40
n(C∩H) = 5
n(H∩V) = 10
n(C∩V) = 5
n(C∩H∩V) = 10

No. of students who played atleast one game
n(C∪H∪V)= n(C)+ n(H)+n(V)– n(C∩H)–n(H∩V)–n(C∩V)+ n(C∩H∩V)
= 50 + 50 + 40 – 5 – 10 – 5 + 10

Total number of students = 130.

No. of students who played only cricket
= n(C)–[n(C∩H) + n(C∩V)+ n(C∩H∩V)]
= 50–(5+5+10) = 30.

No. of students who played only hockey = n(H)–[n(C∩H)+n(H∩V)+ n(C∩H∩V)]
= 50 – (5+10+10) = 25.

No. of students who played only volley ball = n(V) – [n(H∩V) + n(C∩V) + n(C∩H∩V)]

=40-(10+5+10) = 15.

Question-04:In a class of 40 students, each student plays at least one of the games: chess, carom and table tennis. Among the students, 18 play chess, 20 play table tennis and 27 play carom.Further, 7 students play both chess and table tennis, 12 play both table tennis and

carom and 4 play chess, carom and table tennis together. Find the number of students who play chess and carom but not table tennis.
[Janata Bank AEO-RC-2017]
Solution:
Let ,
Number of students play chess=n(A)
Number of students play carom =n(B)
And
Number of students play table tennis=n(C)
Given that,
n(U)=40
n(A)=18
n(B)=27
n(C)=20
n(A∩ C) = 7
n(B∩ C)=12
and
n(A∩B∩C)=4
Suppose,
n(A∩ B)=?
We know that
n(U)= n(A)+ n(B)+n(C)-n(A∩ B) -n(B∩ C)- n(A∩ C)+n(A∩ B∩ C)
Or,40=18+27+20-7-12-n(A∩ B)+4
Or,40=50-n(A∩ B)
Or, n(A∩ B)=10
But there are 4 people who play all three games.
So,
The number of who play chess and carom but not table tennis
=n(A∩
B)-n(A∩ B∩ C)
=10-4
=6
Answer: 6

Question-05:In a class of 120 students,70% can speak only Bengali and the rest can speak English.If 25% of those in the class who can speak English can also Bengali,how many of the students in the class can speak Bengali?
[Probashi Kallyan Bank SO-2018]
Solution:
Only can speak Bengali=120 of 70%=84
Speak English=(120-84)=36
Both English and Bangali speak
=36 of 25%=9

So, Bangali can speak=(84+9)=93
Answer:93

Question-6: In a survey at an airport,55 said that last year they had been to India,53 to Napal and 79 to Bhutan,18 had been to India and Nepal ,17 to India and Bhutan and 25 to Nepal and Bhutan,while 10 had to all three countries.How many travelers took part in the Survey?[Rupali Bank Cash-2018]
Solution:
Let ,
The Number of people who travelled to India=n(A)
The Number of people who travelled to Nepal=n(B)
And
The Number of people who travelled to Bhutan=n(C)
Given that,
n(A)=55
n(B)=53
n(C)=79
n(A∩B) = 18
n(A∩C)=17
n(B∩C)=25
and
n(A∩B∩C)=10
We know that
n(U)=n(A)+n(B)+n(C)-n(A∩B)-n(A∩C)-n(B∩C)+n(A∩B∩C)
Or,n(U)=55+53+79-18-17-25+10
Or,n(U)=137
Hence, 137 members took part in the survey
Answer:137

Alternative:

Total=S+F+G-sum of two group overlap+all three+none
Total=55+53+79-18-17-25+10
=137

Question-07:Proof of identity of 115 people was verified. 65 of them had Passport,30 of them had both Passport and Voter ID. However, 15 of them could not produce any identity documents.How many of them showed up only with Voter ID?
[BKB OFFICER-2017][RAKUB OFFICER-2017]
Solution:
Total people=115
Undocments people=15
So,
Documents people=(115-15)=100
Both voter ID and passport have
=30
Let,

Voter ID have=x people
Only passport have=(65-30)=35 people
Only voter ID have=(x-30) people
So,
Only passport or Voter ID or Both
=35+(x-30)+30
According to the question,
35+(x-30)+30=100
Or, x =65
So,
Only voter ID have=(65-30)=35

Answer: 35.

Question-8:70 students are stydying physics mathematics and chemistry. 40 students study mathematics, 35 study physics and 30 students students chemistry.15 students are studying all the subjects. How many students are studying exactly two of the subjects?

[Sonali Bank Officer-2018]

Solution:

Students that studying physics ,

Set P=35

Students that studying chemistry , Set C = 30

Students that studying maths

Set M = 40

Students are studying all the subjects,PnCnM=15

Let,

PnC + CnM + PnM=x

Total = P + C + M - (PnC + CnM + PnM) + (PnCnM) + Neither

Or,70=35+30+40- x + 15 + 0

Or,x=120-70

Or, x=50

Hence,PnC + CnM + PnM=50

So,Exactly studying two of the subjects=50-(15*3)=5

Answer:5

#Alternative:

Total=All single-(exactly two groups overlap)-{2*all three}+None

Or,70=40+35+30-(Exactly two groups overlap)-2*15+0

Or,70=75 -(Exactly two groups overlap)

Or, Exactly two groups=5

Answer:5

Question-08:A total of 50 employees work in a bank branch of these 22 have taken the accounting course, 15 have taken finance,14 marketing, 9 of them taken exactly 2 of the courses, 1 of them has taken all.How many of the 50 employees have taken none of the course?[Dhaka Bank MTO-2004][BB AD-2001][Premier Bank-2003]

Solution:
Here, one of the employees has taken all of the courses
Nine of the employees have taken exactly 2 of the courses
Number of employee have taken only Accounting = 22 – (9 + 1) = 12
Numbers of employee have taken only Finance = 15 – (9 + 1) = 5
Numbers of employee have taken only Marketing = 14 – 1 = 13
Numbers of total employee have taken at least one course=12+5+13+9+1=40
So, employees who have not taken any course=50 – 40=10
Answer:10

Question-09:Among 50 people, 35 can speak English , 25 can both English and Bangla, and each can speak at least one of the two language.how many speak only bangla?
Solution:
Given that,
Total people=50
Speak English=35
Speak both Bangla & English=25
Only English speak =(35-25)=10
Bangla speak =(50-10)=40
Only Bangla speak(40-25)=15
Answer:15
Alternative:
Total=All single -Both+none
Or,50=35+B-25+0 1
or, B=40
So total 40 speak bangla.
speak only bangla=40-25=15
Answer:15

Question-10:In a group, there were 115 people whose proofs of identity were being verified. Some had passport, some had voter id and some had both. If 65 had passport and 30 had both, how many had voter id only and not passport?

Solution:
$n(P \cup V) = n(P) + n(V) – n(P \cap V)$

115 = 65+n(V) – 30

n(V) = 80

People with only voter id = 80-30 = 50

Answer:50

Question-11:Among a group of people, 40% liked red, 30% liked blue and 30% liked green. 7% liked both red and green, 5% liked both red and blue, 10% liked both green and blue. If 86% of them liked at least one colour, what percentage of people liked all three?

Solution:

We know that,

$n(R \cup B \cup G) = n(R) + n(B) + n(G) - n(R \cap B) - n(B \cap G) - n(R \cap G) + n(R \cap G \cap B)$

$86 = 40+30+30-5-10-7+ n(R \cap G \cap B)$

Solving this gives 8.

Answer:8

Question-12:70 students are stydying physics mathematics and chemistry. 40 students study mathematics, 35 study physics and 30 students students chemistry.15 students are studying all the subjects. How many students are studying exactly two of the subjects? [Rupali Bank Cash Officer(Cancelled)-2018]

Solution:

Students that studying physics ,

Set P=35

Students that studying chemistry , Set C = 30

Students that studying maths

Set M= 40

Students are studying all the subjects,PnCnM=15

Let,

PnC + CnM + PnM=x

Total = P + C + M - (PnC + CnM + PnM) + (PnCnM) + Neither

Or,70=35+30+40- x + 15 + 0

Or,x=120-70

Or, x=50

Hence,PnC + CnM + PnM=50

So,Exactly studying two of the subjects=50-(15*3)=5

Answer:5

#Alternative:

Total=All single-(exactly two groups overlap)-{2*all three}+None

Or,70=40+35+30-(Exactly two groups overlap)-2*15+0

Or,70=75 -(Exactly two groups overlap)

Or, Exactly two groups=5

Answer:5

13.50 junior officers of a bank have different professional background.Of these, 22 have MBM degrees, 15 have Banking diploma & 14 have M.Comin banking.9 of the employees have two of the degrees & One has taken all three of the degrees.How many have none of the degrees. [JBC JO-2009]

Solution:

Here,

One of the employees has taken all of the courses

Nine of the employees have taken exactly of the courses

Number of employee have taken only MBM ={ 22–(9 + 1)}=12

Numbers of employee have taken only Banking diploma ={15–(9 + 1)}=5

Numbers of employee have taken only M.COM =14–1=13

Numbers of total employee have taken at least one course =(12 +5+13+9+1)= 40

So,

Employees who have not taken any course =50–40 =10 Answer:10