Equation/Simplification

Instructor:

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Basic Insight

$x + y = 50$

1. A man has Tk. 480 in the denominations of one-taka notes, five-taka notes and ten-taka notes. The number of notes of each denomination is equal. What is the total number of notes that he has ?

A. 45
B. 60
C. 75
D. 90
E. None of these

$1x + 5x + 10x = 480$

$\Rightarrow 16x = 480$

$x = 30$

$\times 3$

90

30
30
30

90

3. There are two examinations rooms A and B. If 10 students are sent from A to B, then the number of students in each room is the same. If 20 candidates are sent from B to A, then the number of students in A is double the number of students in B. The number of students in room A is:

A. 20

B. 80

C. 100

D. 200

E. None of these

3. The price of 10 chairs is equal to that of 4 tables. The price of 15 chairs and 2 tables together is Tk. 4000. The total price of 12 chairs and 3 tables is:

A. Tk. 3500
B. Tk. 3750
C. Tk. 3840
D. Tk. 3900
E. None of these

$10C = 4T \Rightarrow C = \frac{4}{10}T = \frac{2}{5}T$

$15C + 2T = 4000$

$\Rightarrow 15 \times \frac{2}{5}T + 2T = 4000$

$\Rightarrow 6T + 2T = 4000$

$\Rightarrow 8T = 4000$

$T = 500$

$C = \frac{2}{5} \times 500 = 200$

$24000 + 15000$

$= 39000$

4. One-third of Rahul's savings in National Savings Certificate is equal to one-half of his savings in Public Provident Fund. If he has Tk. 1,50,000 as total savings, how much has he saved in Public Provident Fund ?

A. Tk. 30,000
B. Tk. 50,000
C. Tk. 60,000
D. Tk. 90,000
E. None of these

$\frac{1}{3}N = \frac{1}{2}P \Rightarrow N = \frac{3}{2}P$

$N + P = 150000$

$\Rightarrow \frac{3}{2}P + P = 150000$

$\Rightarrow 3P + 2P = 300000$

$\Rightarrow P = 60000$

5. In a regular week, there are 5 working days and for each day, the working hours are 8. A man gets Tk. 2.40 per hour for regular work and Tk. 3.20 per hours for overtime. If he earns Tk. 432 in 4 weeks, then how many hours does he work for ?

A. 160
B. 175
C. 180
D. 195
E. None of these

$8 \times 5 = 40$ h

$\times 4$

160 h

$\times 2.40$

384 tk

432
− 384
Tk. 48

$\frac{48}{3.20} = 15$ h

160h + 15h = 175 h

6. A man has some hens and cows. If the number of heads be 48 and the number of feet equals 140, then the number of hens will be:

A. 22
B. 23
C. 24
D. 26

$H + C = 48 \Rightarrow C = 48 - H$

$2H + 4C = 140$

$\Rightarrow H + 2C = 70$

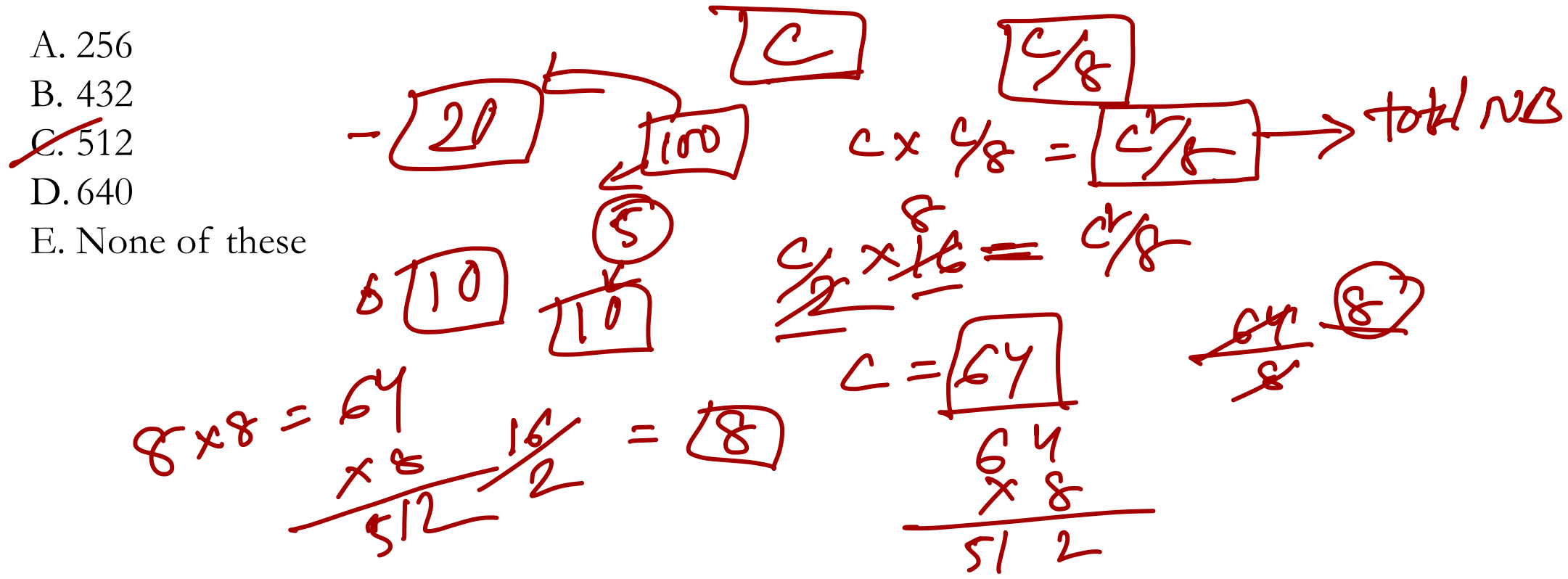
$\Rightarrow H + 2(48 - H) = 70$

$\Rightarrow H + 96 - 2H = 70$

$\Rightarrow H = 26$

7. Free notebooks were distributed equally among children of a class. The number of notebooks each child got was one-eighth of the number of children. Had the number of children been half, each child would have got 16 notebooks. Total how many notebooks were distributed ?

A. 256
B. 432
C. 512
D. 640
E. None of these



8. If $1/x + 1/y = 5$ and $1/x - 1/y = 3$, what is the value of x?

A. 1/4
B. 1/2
C. 1/6
D. 1/8

$$\frac{1}{x} + \frac{1}{y} = 5$$

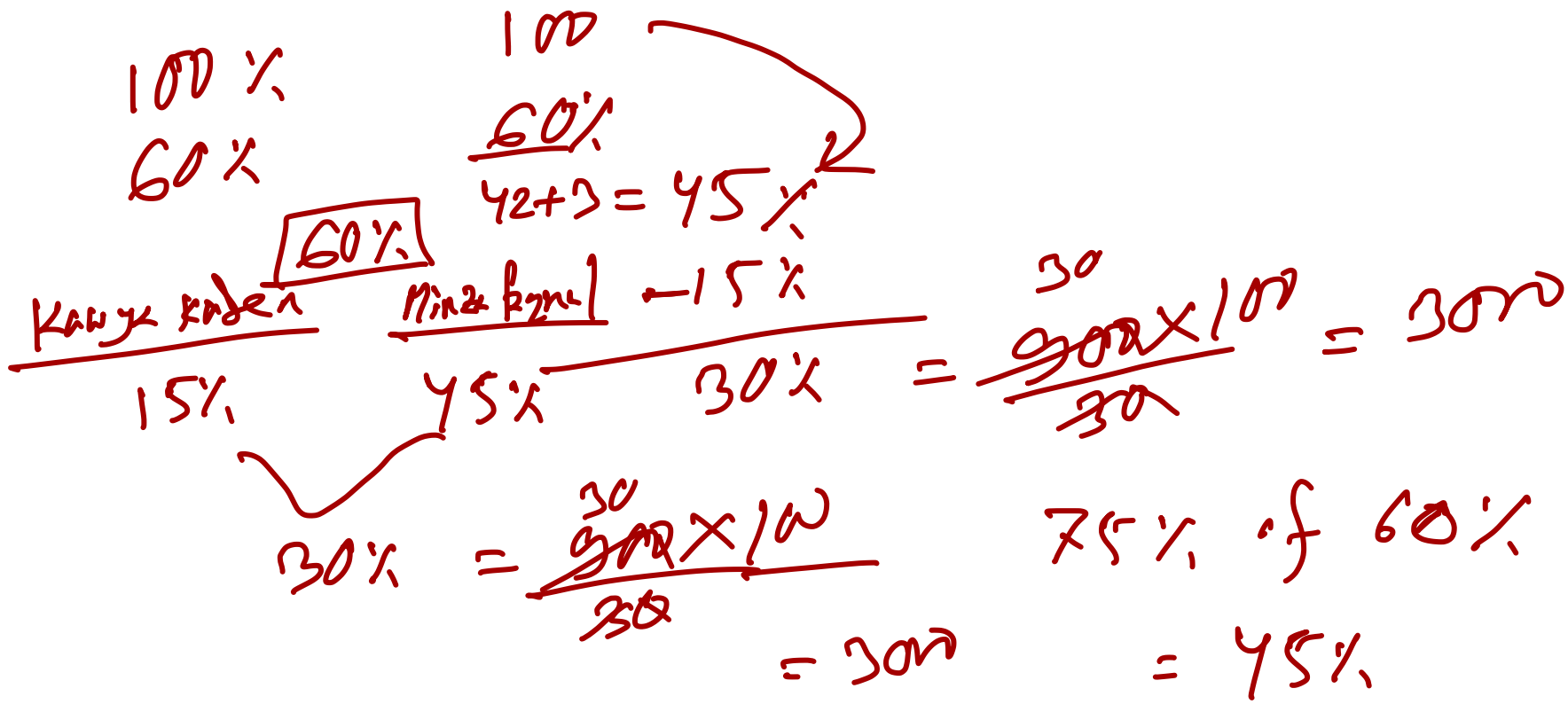
$$\frac{1}{x} - \frac{1}{y} = 3$$

$$\frac{2}{x} = 8$$

$$x = \frac{2}{8} = \frac{1}{4}$$

9. In an election, 60% of the voters cast their votes. A candidate wins with 75% of the votes cast and wins by a margin of 900 votes. How many total voters were there?

A) 2500
B) 3000
C) 4000
D) 5000



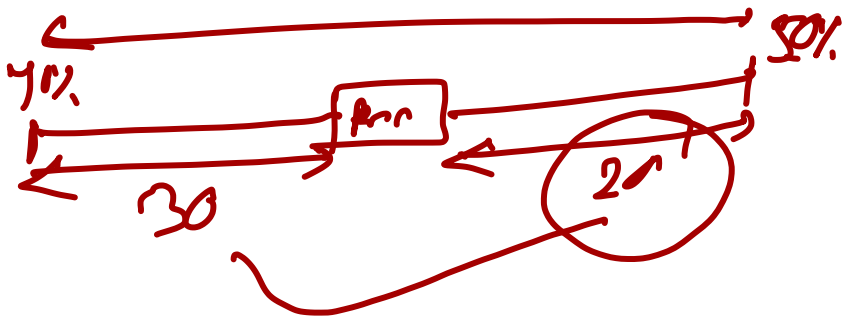
10. In an examination, a student scores 40% of the total marks and fails by 30 marks. Another student who scores 50% of the total marks gets 20 marks more than the passing marks. Find the passing marks.

A) 150
B) 180
C) 200
D) 220

10% ← 40%, 50%

30

20



50

$10\% = \frac{50 \times 10}{10}$

$= 500 = \text{Total Mark}$

$50\% = \frac{250}{-20}$

230

11. 10% of the voters did not cast their votes in an election between two candidates, 10% of the total votes are declared invalid. The winning candidate secures 54% of the valid votes and wins by 1600 votes. Find the total number of votes cast.

A) 25,000
B) 30,000
C) 35,000
D) 40,000

100x

90x ⟶ cast

−9x

81x

9x @ 10%

= 9x

54% of 81x − 46% of 81x = 1600

$\Rightarrow \frac{54 \times 81x}{100} - \frac{46 \times 81x}{100} = 1600$ 20

$\Rightarrow 54x - 46x = 2000$

$\Rightarrow 8x = 2000 \Rightarrow x = 250 \times 100$

$= 25000$

12. The sum of the ages of a father and son is 50 years. Five years ago, the father's age was four times that of his son. Find the present age of the son.

A) 10 years
B) 12 years
C) 13 years
D) 16 years

$F + S = 50$

$(F - 5) = 2(S - 5)$

Yogesh.

$x + 4x = 40$

$\Rightarrow 5x = 40$

$x = 8$

$8 + 5 = 13$

13. David gets on the elevator at the 11^{th} floor of a building and rides up at the rate of 57 floors per minute. At the same time, Albert gets on an elevator at the 51st floor of the same building and rides down at the rate of 63 floors per minute. If they continue travelling at these rates, then at which floor will their paths cross ?

A. 19
B. 28
C. 30
D. 37

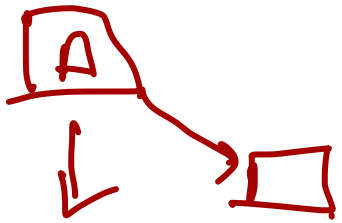
D: $11 + 57t$ = A: $151 - 63t$

$\Rightarrow 120t = 40$

t minute $\quad t = \frac{1}{3}$ minute

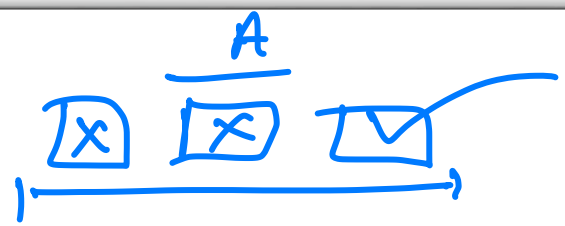
$11 + 57 \times \frac{1}{3} = 30$

$151 - 63 \times \frac{1}{3} = 30$



14. A fires 5 shots to B's 3 but A kills only once in 3 shots while B kills once in 2 shots. When B has missed 27 times, A has killed:

A. 30 birds
B. 60 birds
C. 72 birds
D. 90 birds



$\frac{90}{3} = 30$

27 miss + 27 = 54 shot

B → 3 = A ... 5 S

B ... 1 = 5/3

∴ 54 = $\frac{5 \times 54}{3}$ = 90 shot

Thank You