

# Trigonometry-02

**Md. Labu Miah**

**Instructor, P2A**

**Q1: If  $\sin A + \sin^2 A = 1$ , then the value of expression  $\cos^2 A + \cos^4 A$  is-** [Rupali Bank (Cash)-18]

$$\sin A + \sin^2 A = 1$$

$$\sin A = 1 - \sin^2 A$$

$$(\sin A)^2 = (\cos^2 A)^2$$

$$\sin^2 A = \cos^4 A$$

$$1 - \cos^2 A = \cos^4 A$$

$$\cos^2 A + \cos^4 A$$

$$1 =$$

**Q2: If  $\sec\theta + \tan\theta = x$ , then  $\tan\theta$  is-** [Rupali Bank (Cash)-18, Sonali Bank (SO)-18]

a.  $\frac{x^2+1}{x}$  ✓

b.  $\frac{x^2-1}{x}$  ✗

c.  $\frac{x^2+1}{2x}$  ✗

d.  $\frac{x^2-1}{2x}$  ✓

$$\begin{aligned} \sec\theta - \tan\theta &= 1 \\ (\sec\theta + \tan\theta)(\sec\theta - \tan\theta) &= 1 \\ x(\sec\theta - \tan\theta) &= 1 \end{aligned}$$

$$\begin{aligned} \cos\theta - \sin\theta &= 1 \\ \cos\theta + \sin\theta &= x \\ \cos\theta - \sin\theta &= \frac{1}{x} \end{aligned}$$

$$\begin{aligned} 2\tan\theta &= x - \frac{1}{x} \\ \tan\theta &= \frac{x^2 - 1}{2x} \end{aligned}$$

$$\begin{aligned} \sec\theta - \tan\theta &= \frac{1}{x} \\ \sec\theta + \tan\theta &= x \\ \hline -2\tan\theta &= -x + \frac{1}{x} \end{aligned}$$

Q3: If  $1 + \sin \theta = x \cos \theta$ , then  $\tan \theta$  is- [BB (AD) 18]

a.  $\frac{x^2+1}{x}$

b.  $\frac{x^2-1}{x}$

c.  $\frac{x^2+1}{2x}$

d.  $\frac{x^2-1}{2x}$

$$\frac{1}{\cos \theta} + \frac{\sin \theta}{\cos \theta} = \frac{x \cos \theta}{\cos \theta}$$

$$\sec \theta + \tan \theta = x$$

(H.W)

Q4: If  $\cos A + \sin A = 1$ , then  $A = ?$  [PKB (Off)-20]

$A = 0^\circ, 30^\circ, 45^\circ, 60^\circ, 90^\circ$

$\cos 0^\circ + \sin 0^\circ = 1 + 0 = 1$  ✓

$\cos 90^\circ + \sin 90^\circ = 0 + 1 = 1$

$A \neq 0^\circ, 90^\circ$

$90^\circ, \emptyset$

$$(\sin A + \cos A)^2 = 1$$

$$\sin^2 A + \cos^2 A + 2\cos A \cdot \sin A = 1$$

$$2\cos A \cdot \sin A = 1 - 1 = 0$$

$$\cos A \cdot \sin A = 0$$

$$\cos A = 0$$

$$A = \underline{90^\circ}$$

$$\text{or } \underline{\sin A} = 0$$

$$A = \underline{0^\circ}$$

**Q5: If  $\tan(x - 30^\circ) = \frac{1}{\sqrt{3}}$ , then  $\cos x = ?$  [PKB (Off)-20]**

$$\tan(x - 30^\circ) = \frac{1}{\sqrt{3}} = \tan 30^\circ$$

$$x - 30^\circ = 30^\circ$$

$$x = 60^\circ$$

$$\cos 60^\circ =$$

$$\frac{1}{2}$$

**Q6: If  $\cot(x - 30^\circ) = \frac{1}{\sqrt{3}}$ , then  $\sin x = ?$  [Comb Bank (SO)-18]**

(H.W)

**Q7: If  $\sec(x - 30^\circ) = \frac{2}{\sqrt{3}}$ , then  $\tan x = ?$**

(H.W.)

Q8: If  $\cos^2 \theta - \sin^2 \theta = x$  then  $1 + \cos^4 \theta - \sin^4 \theta = ?$  [Comb Bank (SO)-18]

$$\cos^4 \theta - \sin^4 \theta = (\cos^2 \theta)^2 - (\sin^2 \theta)^2$$

$$= (\cos^2 \theta + \sin^2 \theta) (\cos^2 \theta - \sin^2 \theta)$$

$$= 1 \times x$$

$$= x$$

$$1 + \cos^4 \theta - \sin^4 \theta = 1 + x$$

**Q9: If  $\sin A + \sin^2 A = 1$ , then  $1 + \cos^2 A + \cos^4 A = ?$**  [Comb Bank, Rupali

Bank, BB (Off) -18]

$$1 + 1 = 2$$

Q10: If  $\sin x = \frac{3}{4}$  then  $\cos x = ?$  [Bepza (AM)-21]

3, 4, 5

$$\sin x = \frac{3}{4}$$

$$\sin^2 x + \cos^2 x = 1$$

$$\cos^2 x = 1 - \sin^2 x$$
$$= 1 - \left(\frac{3}{4}\right)^2$$

$$= 1 - \frac{9}{16}$$

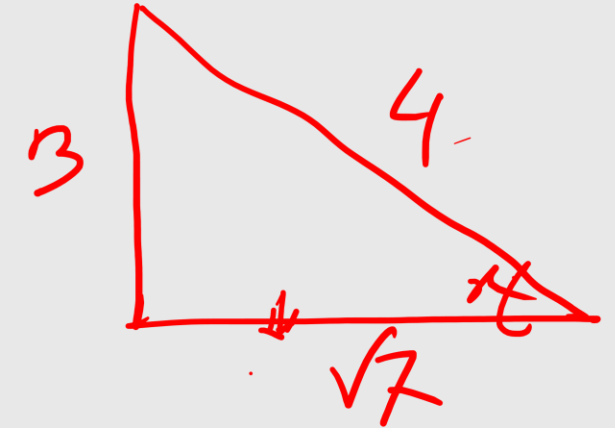
$$= \frac{16-9}{16} = \frac{7}{16}$$

$$\sin x = \frac{3}{4}$$

$$\cos x = \frac{\sqrt{7}}{4}$$

$$\cos x = \sqrt{\frac{7}{16}}$$

$$= \frac{\sqrt{7}}{4}$$



$$\sqrt{4^2 - 3^2}$$
$$= \sqrt{16 - 9}$$

$$= \sqrt{7}$$

Q11: sin 3690° = ? [BREB (AR)-20]

$$\underline{20} \times \underline{180} = \underline{3600}$$

$$\sin 3690^\circ$$

$$\underline{10} \times \underline{\underline{360}} = 3600$$

$$\sin (20 \times 180 + 90^\circ)$$

$$\sin (10 \times 360 + \underline{90^\circ})$$

$$\sin 90^\circ = \underline{\underline{1}}$$

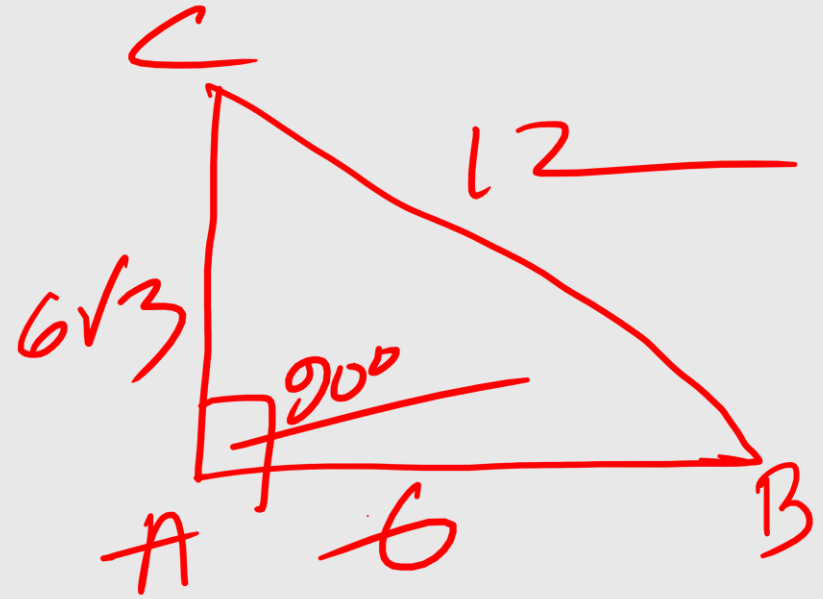


Q12: If in  $\triangle ABC$ ,  $AB = 6\text{cm}$ ,  $BC = 12\text{cm}$  and  $CA = 6\sqrt{3}\text{cm}$  then the measure of  $\angle A$  is — [Janata Bank (RC)-23 (21 Based)]

$$12^2 = 144$$

$$6^2 + (6\sqrt{3})^2$$

$$36 + 36 \times 3 = 36 + 108$$
$$= 144$$



Q13: The angles of a triangle are in the proportion of 1 : 2 : 3 and the length of the smallest side is 1 cm what is the length of the longest side of the triangle? [BB (AD)-22]

$30^\circ$

$$2x = 2 \times 30^\circ = 60^\circ$$

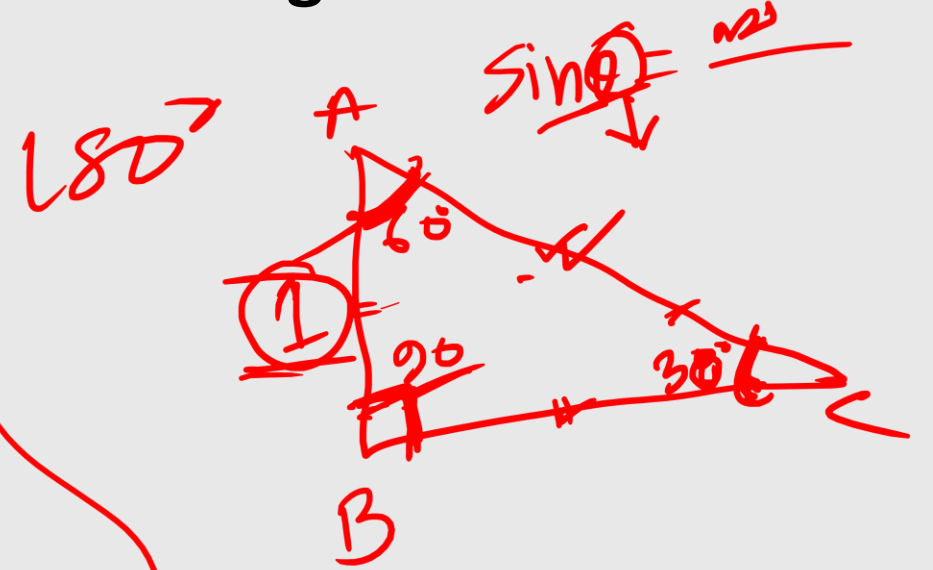
$$3x = 3 \times 30^\circ = 90^\circ$$

1 : 2 : 3

$$1x \frac{180}{6} = 30^\circ$$

$$2x \frac{180}{6} = 60^\circ$$

$$3x \frac{180}{6} = 90^\circ$$



$$\sin 30^\circ = \frac{1}{AC}$$

$$\Rightarrow \frac{1}{2} = \frac{1}{AC}$$

$$\Rightarrow AC = \underline{2 \text{ cm}}$$

Q14: A pole 6 m high casts a shadow  $2\sqrt{3}$  m long on the ground, then the

Sun's elevation is- [Rupali & Sonali Bank (SO) 18, BB (AD) 18]

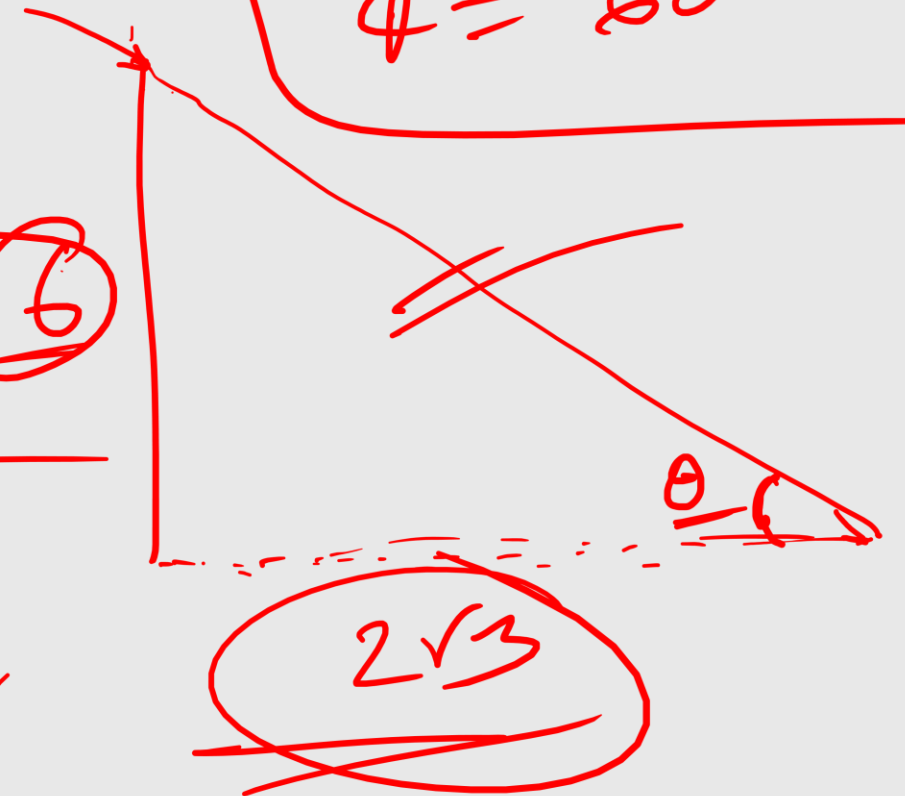
$$\tan \theta = \frac{6}{2\sqrt{3}} = \frac{3}{\sqrt{3}}$$



$$\cot \theta = \frac{1}{\sqrt{3}}$$
$$\theta = 60^\circ$$

$$\tan \theta = \frac{\sqrt{3} \cdot \sqrt{3}}{\sqrt{3}} = \sqrt{3}$$

$$\theta = 60^\circ$$

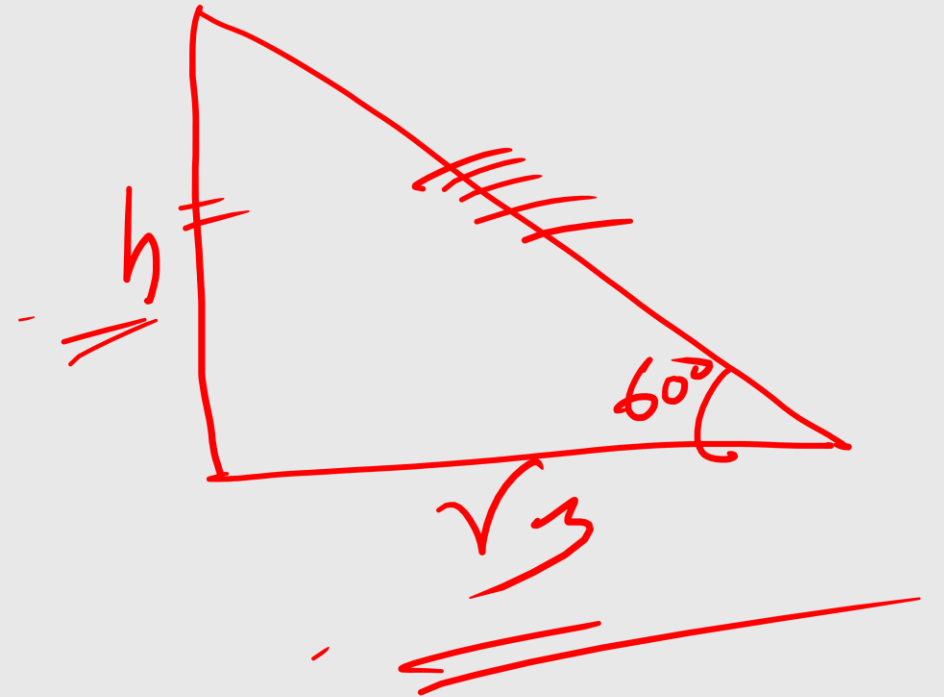


Q15: A pole casts a  $\sqrt{3}$  m shadow on a ground on an elevation of  $60^\circ$ . The height of the pole is? *[Comb Bank (Off)-18]*

$$\underline{\underline{\tan 60^\circ}} = \frac{h}{\sqrt{3}}$$

$$\sqrt{3} = \frac{h}{\sqrt{3}}$$

$$h = \sqrt{3} \times \sqrt{3} = \underline{\underline{3}}$$



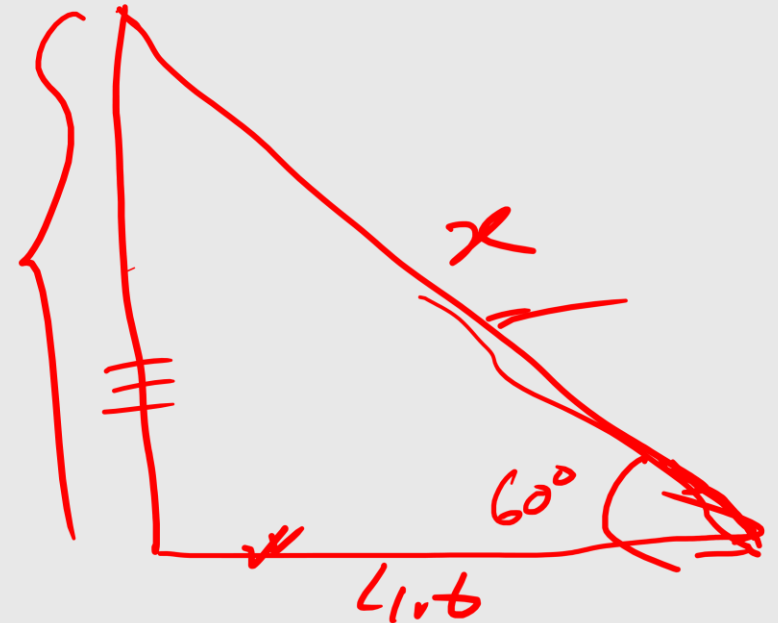
**Q16: The angle of elevation of a ladder leaning against a wall is 60° and the foot of the ladder is 4.6m away from the wall. The length of the ladder is-**

*[Comb Bank (SO)-19]*

$$\cos 60^\circ = \frac{4.6}{x}$$

$$\frac{1}{2} = \frac{4.6}{x}$$

$$\Rightarrow x = 4.6 \times 2 = \underline{9.2}$$



~~18~~

~~26, 27, 3~~

~~3~~

written-4

~~Preli~~

~~5~~  
↓

~~15~~

# Thank You

~~Extra~~ →

~~4,5~~

~~3~~