SHIKSHA CLASSES

Subject : Geometry | **Question Paper** | **Total Marks : 20**
Class : X | **6. Trigonometry** | **Time : 1 Hour**

Q.1:A) Choose the correct alternative from the following questions. 2

1) $1+\cot^2\theta = ?$

a) $\cot^2\theta$ b) $\text{cosec}^2\theta$ c) $\sec^2\theta$ d) $\tan^2\theta$

2) When we see at a higher level, from the horizontal line, angled formed is ____

a) Angle of elevation b) Angle of depression

c) 0 d) Straight angle.

: B) Solve the following questions. 1

1) If $3\sin\theta - 4\cos\theta = 0$, find the value of θ

Q.2: A) Attempt any ONE of the following. 2

1) If $\sec\theta = \frac{25}{7}$, find the value of $\tan\theta$ by using identity.

$\tan^2\theta =$ [ ] ..... (Identity)

$= \left(\frac{25}{7}\right)^2 - 1$

$=$ [ ] $- 1 = \frac{625-49}{49} =$ [ ]

$\tan\theta =$ [ ]

2) If $\cos\theta = \frac{5}{13}$, find the value of $\text{cosec}\theta$ by using identity.

: B) Attempt any ONE of the following. 2

1) If $\cot\theta = \frac{15}{8}$, find the value of $\sin\theta$.

2) Prove that $\cos^2\theta\left(1+\tan^2\theta\right) = 1$

Q.3 A) : Attempt any ONE of the following. 3

1) If $5\sec\theta - 12\,\text{cosec}\theta = 0$, find the values of $\sec\theta, \cos\theta$ and $\sin\theta$

$5\sec\theta - 12\text{cosec}\theta = 0$ **..... (Given)**

$5\sec\theta = \square$

$\therefore \dfrac{\sec\theta}{\text{cosec}\theta} = \dfrac{\square}{\square}$

$\therefore \dfrac{\frac{1}{\cos\theta}}{\frac{1}{\sin\theta}} = \dfrac{\square}{\square}$, $\dfrac{\sin\theta}{\cos\theta} = \dfrac{12}{5}$

$\tan\theta = \dfrac{\square}{\square}$

$\sec^2\theta = \square$ ------(Identity)

$= 1 + \dfrac{144}{25}$

$= \dfrac{\square}{\square}$

$\sec\theta = \dfrac{13}{5}$

$\cos\theta = \dfrac{1}{\square} = \dfrac{5}{13}$

$\sin^2 = 1 - \square$ ------(Identity)

$= 1 - \left(\dfrac{5}{13}\right)^2 = 1 - \dfrac{25}{169} = \dfrac{144}{169}$

$\therefore \sin\theta = \dfrac{\square}{\square}$

2) If $\tan\theta + \frac{1}{\tan\theta} = 2,$ then show that $\tan^2\theta + \frac{1}{\tan^2\theta} = 2,$

: B) Attempt any ONE of the following. 3

1) An observer at a distance of 10m from a tree looks at the top of the tree, the angle of elevation is 60^0. what is the height of the tree? $\left(\sqrt{3} = 1.73\right)$.

2) Two buildings are facing each other on a road of width 12 metre. From the top of the first building which is 10 metre high, the angle of elevation of the top of the second is found to be 60^0 what is the height of the second building?

Q. 4 : Attempt any ONE of the following. 4

1) Show that $\frac{\sin\theta - \cos\theta + 1}{\sin\theta + \cos\theta - 1} = \frac{1}{\sec\theta - \tan\theta}$

2) To find the width of the river, a man observes the top of a tower on the opposite bank making an angle of elevation of 61^0 When he moves 50m backward from bank and observes the same top of the tower, his line of vision makes an angle of elevation of 35^0. Find the height of the tower and width of the river. $\left(\tan 61^0 = 1.8, \tan 35^0 = 0.7\right)$

Q.5: Attempt any ONE of the following. 3

1) Prove $\sec^6 x - \tan^6 x = 1 + 3\sec^2 x \times \tan^2 x$

2) Show that $\sec^4 A\,(1-\sin^4 A) - 2\tan^2 A = 1$

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