

TRIGONOMETRY

1. The value of $\frac{(\cot\theta)^2+1}{(\cot\theta)^2-1}$ is:

- a. $\sin 2\theta$ b. $\cos 2\theta$
c. $\operatorname{cosec} 2\theta$ d. $\sec 2\theta$

2. $\tan A - \tan B = x$ and $\cot A - \cot B = y$, then $\cot(A-B)$ is:

- a. $y+1/x$ b. $1/xy$
c. $\frac{1}{x} - \frac{1}{y}$ d. $\frac{1}{x} + \frac{1}{y}$

3. If $\sin \theta = -4/5$ and θ lies in the third quadrant, then $\cos \frac{\theta}{2}$ is:

- a. $\frac{1}{\sqrt{5}}$ b. $-\frac{1}{\sqrt{5}}$
c. $\sqrt{\frac{2}{5}}$ d. $-\sqrt{\frac{2}{5}}$

4. The value of $\cos 1^\circ \cos 2^\circ \cos 3^\circ \dots \cos 100^\circ$ is equal to

- a. 1 b. -1
c. 0 d. none of these

5. The value of $\sin 12^\circ \sin 48^\circ \sin 54^\circ$ is equal to:

- a. $1/16$ b. $1/32$ c. $1/8$ d. $1/4$

6. The value of expression $1 - \frac{\sin^2 y}{1 + \cos y} + \frac{1 + \cos y}{\sin y} - \frac{\sin y}{1 - \cos y}$ is equal to

- a. 0 b. 1 c. $\sin y$ d. $\cos y$

7. The greatest and least value of $\sin x \cos x$ are

- a. 1, -1 b. $1/2, -1/2$
c. $1/4, -1/4$ d. 2, -2

8. If $A = \sin^2 x + \cos^4 x$, then for all real values of x

- a. $1 \leq A \leq 2$ b. $3/4 \leq A \leq 1$
c. $13/16 \leq A \leq 1$ d. $3/4 \leq A \leq 13/16$

9. A ladder 15 m long just reaches the top of a vertical wall. If ladder makes an angle of 60° with the wall, the height of the wall is

a. 7.5 m

b. $5\sqrt{3}$

c. $\frac{15\sqrt{3}}{2}$

d. $10\sqrt{3}$

10. from a point on the bridge across a river the angle of depression of the banks on the opposite side of the river are 30° and 45° respectively. If the bridge is at height of 3 m from the bank, the width of the river is

a. $2(\sqrt{3} + 1)$ m

b. $3(\sqrt{3} + 1)$ m

c. $4(\sqrt{3} + 1)$ m

d. $2(2\sqrt{3} + 1)$ m

11. A ladder just reaches at the top of the wall. The foot of the ladder is 8 m away from the foot of the wall. The ladder makes an angle of 60° with the ground. The length of the ladder is

a. 4m

b. 16 m

c. $\frac{16\sqrt{3}}{3}$

d. $16\sqrt{3}$

12. A ladder of 15 m just reaches at the top of a vertical wall. The ladder makes an angle of 60° with the wall, the distance of the foot of the ladder from the wall is

a. 7.5m

b. $5\sqrt{3}$

c. $10\sqrt{3}$ m

d. $\frac{15\sqrt{3}}{2}$ m

13. If $\sin A + \cos A = \sqrt{3}$, then the value of $\frac{3}{4}(\tan A + \cot A)$ is

a. 1

b. $\frac{3}{4}$

c. $\frac{3}{2}$

d. 3

14. A ship is approaching a light home, 100m high above the sea level. The angle of depression of the ship as observed from the top of the light home, changes from 30° to 45° . The distance, in m, travelled by the ship during this period of observation is

a. $100(\sqrt{3} + 1)$

b. $100(\sqrt{3} + 1)$

c. $100\sqrt{3} + 1$

d. $100\sqrt{3} - 1$

15. If $\frac{\sec\theta + \tan\theta}{\sec\theta - \tan\theta} = \frac{5}{3}$ $0^\circ \leq \theta \leq 90^\circ$ then the value of cosec θ is

a. 2

b. $\frac{\sqrt{15}}{4}$

c. $4/\sqrt{15}$

d. 4

16. The length of the shadow of a pole is 90 m, when the sun elevation is 30° . The length of the shadow of the pole is x meter when elevation of sun is 60° . The value of x is

a. $15\sqrt{3}$

b. 30

c. 45

d. $20\sqrt{3}$

17. From the top of the tower 50 m high the angles of depression of the top and bottom of a pole are found to be 45° and 60° respectively. The height of the pole, in m, is

a. $50(\sqrt{3} - 1)$

b. $50(\sqrt{3} + 1)$

c. $50(3 - \sqrt{3})$

d. $50(\sqrt{3} - 1)$

18. If $x = (1 + \cot A - \operatorname{cosec} A)(1 + \tan A + \sec A)$, $0 < A < 90^\circ$, then the value of x is

a. -2

b. -1

c. 1

d. 2

19. the expression $\tan^2 A + \cot^2 A - \sec^2 A \operatorname{cosec}^2 A$ is equal to

a. 0

b. 1

c. -1

d. -2

20. If $2\sin^2 A - 5\sin A \cos A + 7\cos^2 A = 1$, then possible value of $\tan A$ are

a. 2,3

b. 1,3

c. $2, 5/2$

d. 3,4