

Multiple Choice Questions

1. If $\tan A = \cot B$, then: (a) $A - B = 90^\circ$ (b) $A = B = 90^\circ$ (c) $A + B = 90^\circ$ (d) $B - A = 90^\circ$
2. $(\sec^2 \theta - 1)(1 - \csc^2 \theta)$ is equal to: (a) $\sec \theta$ (b) $\cot \theta$ (c) 0 (d) $\csc \theta$
3. $\sqrt{\frac{\sec \theta - 1}{\sec \theta + 1}} + \sqrt{\frac{\sec \theta + 1}{\sec \theta - 1}}$ is equal to: (a) $2 \csc \theta$ (b) $2 \sec \theta$ (c) $2 \tan \theta$ (d) $2 \sin \theta$

Trigonometry Problems

1. (i) If θ is an acute angle and $\csc \theta = \sqrt{5}$, find the value of $\cot \theta - \cos \theta$.
(ii) If θ is an acute angle and $\tan \theta = \frac{8}{15}$, find the value of $\sec \theta + \csc \theta$.
3. If $\frac{4}{3}(\sec^2 59^\circ - \cot^2 31^\circ) - \frac{2}{3} \sin 90^\circ + 3 \tan^2 56^\circ \tan^2 34^\circ = \frac{x}{3}$, then find the value of x .

2. Evaluate the following:
(i)

$$2 \times \left(\frac{\cos^2 20^\circ + \cos^2 70^\circ}{\sin^2 25^\circ + \sin^2 65^\circ} \right) - \tan 45^\circ + \tan 13^\circ \tan 23^\circ \tan 30^\circ \tan 67^\circ \tan 77^\circ$$

(ii)

$$\frac{\sin^2 22^\circ + \sin^2 68^\circ}{\cos^2 22^\circ + \cos^2 68^\circ} + \sin^2 63^\circ + \cos 63^\circ \sin 27^\circ$$

Prove the following identities (4 to 10):

4.

$$\frac{\cos A}{1 - \sin A} + \frac{\cos A}{1 + \sin A} = 2 \sec A$$

5.

$$\frac{\cos A}{\csc A + 1} + \frac{\cos A}{\csc A - 1} = 2 \tan A$$

6.

$$\frac{(\cos \theta - \sin \theta)(1 + \tan \theta)}{2 \cos^2 \theta - 1} = \sec \theta$$