

Trigonometric Identities Ex 6.2 Q11

Answer:

Given:
$$\csc\theta = \frac{13}{12}$$

We have to find the value of the expression $\frac{2\sin\theta - 3\cos\theta}{4\sin\theta - 9\cos\theta}$

Now,

$$\cos \theta = \frac{13}{12}$$

$$\Rightarrow \sin \theta = \frac{1}{\csc \theta} = \frac{1}{\frac{13}{12}} = \frac{12}{13}$$

$$\cos \theta = \sqrt{1 - \sin^2 \theta} = \sqrt{1 - \left(\frac{12}{13}\right)^2} = \frac{5}{13}$$

Therefore,

$$\frac{2\sin\theta - 3\cos\theta}{4\sin\theta - 9\cos\theta} = \frac{2 \times \frac{12}{13} - 3 \times \frac{5}{13}}{4 \times \frac{12}{13} - 9 \times \frac{5}{13}}$$
$$= 3$$

Hence, the value of the expression is 3.

Trigonometric Identities Ex 6.2 Q12 Answer:

Given: $\sin \theta + \cos \theta = \sqrt{2} \cos (90^{\circ} - \theta)$

We have to find the value of $\cot \theta$.

Now,

$$\sin \theta + \cos \theta = \sqrt{2} \cos \left(90^{\circ} - \theta\right)$$

 $\Rightarrow \sin \theta + \cos \theta = \sqrt{2} \sin \theta$ (since, $\cos \left(90^{\circ} - \theta\right) = \sin \theta$)
 $\Rightarrow \cos \theta = \left(\sqrt{2} - 1\right) \sin \theta$
 $\Rightarrow \frac{\cos \theta}{\sin \theta} = \sqrt{2} - 1$
 $\Rightarrow \cot \theta = \sqrt{2} - 1$
Hence, $\cot \theta = \sqrt{2} - 1$

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