Trigonometric Identities Ex 6.2 Q11

Answer :

Given: $\operatorname{cosec}\theta = \frac{13}{12}$

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

Now,

$$\operatorname{cosec}\theta = \frac{13}{12}$$

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

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

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: $\sin\theta + \cos\theta = \sqrt{2}\cos\left(90^0 - \theta\right)$

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

Now,

$$\sin\theta + \cos\theta = \sqrt{2}\cos\left(90^0 - \theta\right)$$

$$\Rightarrow \sin\theta + \cos\theta = \sqrt{2}\sin\theta \qquad \left(\text{since, } \cos\left(90^0 - \theta\right) = \sin\theta\right)$$

$$\Rightarrow \cos\theta = \left(\sqrt{2} - 1\right)\sin\theta$$

$$\Rightarrow \frac{\cos\theta}{\sin\theta} = \sqrt{2} - 1$$

$$\Rightarrow \cot\theta = \sqrt{2} - 1$$

Hence, $\boxed{\cot\theta = \sqrt{2} - 1}$

********** END **********