



Trigonometric Ratios Ex 5.3 Q13

Answer :

We have: $\sec \theta = \operatorname{cosec} 60^\circ$ where θ is positive acute angle

$$\Rightarrow \operatorname{cosec}(90^\circ - \theta) = \operatorname{cosec} 60^\circ$$

$$\Rightarrow 90^\circ - \theta = 60^\circ$$

$$\Rightarrow \theta = 30^\circ$$

Now we have to find $2 \cos^2 \theta - 1$

Put $\theta = 30^\circ$

$$= 2 \times \cos^2 30^\circ - 1$$

$$= 2 \times \left(\frac{\sqrt{3}}{2} \right)^2 - 1$$

$$= 2 \times \frac{3}{4} - 1$$

$$= \frac{1}{2}$$

Hence the value of $2 \cos^2 \theta - 1$ is $\boxed{\frac{1}{2}}$

Trigonometric Ratios Ex 5.3 Q14

Answer :

We have: $\cos 2\theta = \sin 4\theta$

Given in question 2θ and 4θ are acute angles. We have to find θ

Now we have

$$\cos 2\theta = \sin 4\theta$$

$$\Rightarrow \sin(90^\circ - 2\theta) = \sin 4\theta$$

$$\Rightarrow 90^\circ - 2\theta = 4\theta$$

$$\Rightarrow 6\theta = 90^\circ$$

Therefore $\boxed{\theta = 15^\circ}$

Trigonometric Ratios Ex 5.3 Q15

Answer :

We have: $\sin 3\theta = \cos(\theta - 6^\circ)$ where 3θ and $(\theta - 6^\circ)$ are acute angles

We have to find θ

Now we proceed as to find θ

$$\sin 3\theta = \cos(\theta - 6^\circ)$$

$$\Rightarrow \sin 3\theta = \sin[90^\circ - (\theta - 6^\circ)]$$

$$\Rightarrow 3\theta = 90^\circ - \theta + 6^\circ$$

$$\Rightarrow 4\theta = 96^\circ$$

Therefore $\boxed{\theta = 24^\circ}$

***** END *****