27. Find the general solution of the equation

$5\cos^2\theta + 7\sin^2\theta - 6 = 0$

Solution:

According to the question,

$5\cos^2\theta + 7\sin^2\theta - 6 = 0$

We know that,

$\sin^2\theta = 1 - \cos^2\theta$

Therefore, $5\cos^2\theta + 7(1 - \cos^2\theta) - 6 = 0$

$\Rightarrow 5\cos^2\theta + 7 - 7\cos^2\theta - 6 = 0$

$\Rightarrow -2\cos^2\theta + 1 = 0$

$\Rightarrow \cos^2\theta = \frac{1}{2}$

Therefore, $\cos\theta = \pm 1/\sqrt{2}$

Therefore, $\cos\theta = \cos \pi/4$ or $\cos\theta = \cos 3\pi/4$

Since, solution of $\cos x = \cos \alpha$ is given by

$x = 2m\pi \pm \alpha \, \forall \, m \in Z$

$\theta = n\pi \pm \pi/4, n \in Z$