

Trigonometry Worksheet: Trigonometric Equations (2)

Solve the trigonometric equation given by

$$3 \sec^2 x - 4 = 0$$

$$\Rightarrow \sec^2(x) = \frac{4}{3}$$

$$\Rightarrow \sec(x) = \pm \frac{2}{\sqrt{3}}$$

$$\Rightarrow \cos(x) = \pm \frac{\sqrt{3}}{2}$$

a) let us solve $\cos(x) = \frac{\sqrt{3}}{2}$

on the interval $[0, 2\pi)$ two solutions

$$x = \frac{\pi}{6} \text{ and } x = \frac{11\pi}{6}$$

and because $\cos(x)$ has a period of 2π ,
there are infinitely many solutions:

$$\underline{x = \frac{\pi}{6} + 2k\pi} \text{ and } \underline{x = \frac{11\pi}{6} + 2k\pi.}$$

b) solve $\cos(x) = -\frac{\sqrt{3}}{2}$

Solutions on the interval $[0, 2\pi)$ are

$$x = \frac{5\pi}{6} \text{ and } x = \frac{7\pi}{6}$$

All solutions may be written as: $x = \frac{5\pi}{6} + 2k\pi$
and $x = \frac{7\pi}{6} + 2k\pi$