

## Equations

Name Key

## Solve the equation.

1)  $2 \cos x - 1 = 0$

$$x = \pi/3 + 2\pi k$$

$$x = 5\pi/3 + 2\pi k$$

2)  $\csc x - 2 = 0$

$$x = \pi/6 + 2\pi k$$

$$x = 5\pi/6 + 2\pi k$$

3)  $3 \tan^2 2x - 1 = 0$

$$2x = \pi/6, \pi/6, 5\pi/6$$

$$x = \pi/12 + \pi/2 k$$

$$x = 7\pi/12 + \pi/2 k$$

$$x = 5\pi/12 + \pi/2 k$$

$$x = 11\pi/12 + \pi/2 k$$

5)  $2 \sin^2 x - \sin x - 1 = 0$

$$(2\sin x + 1)(\sin x - 1)$$

$$x = 7\pi/6 + 2\pi k \quad x = \pi/2 + 2\pi k$$

$$x = 5\pi/6 + 2\pi k$$

7)  $2 \cos x + 1 = 0$

$$x = 2\pi/3 + 2\pi k$$

$$x = 4\pi/3 + 2\pi k$$

4)  $2 \cos^2 4x - 1 = 0$

$$4x = \pi/4, 7\pi/4$$

$$x = \pi/16 + \pi/2 k$$

$$x = 7\pi/16 + \pi/2 k$$

$$x = 3\pi/16 + \pi/2 k$$

$$x = 5\pi/16 + \pi/2 k$$

6)  $\sec^4 x - 4 \sec^2 x = 0$

$$\sec^2 x (\sec^2 x - 4) = 0$$

$$\sec x = \pm 2$$

$$x = \pi/3 + 2\pi k \quad x = 4\pi/3 + 2\pi k$$

$$x = 2\pi/3 + 2\pi k \quad x = 5\pi/3 + 2\pi k$$

8)  $2 \sin x - 1 = 0$

$$x = \pi/6 + 2\pi k$$

$$x = 5\pi/6 + 2\pi k$$

$$9) \sqrt{3} \csc x - 2 = 0$$

$$\csc x = \frac{2}{\sqrt{3}}$$

$$\sin x = \frac{\sqrt{3}}{2}$$

$$x = \frac{\pi}{3} + 2\pi k$$

$$x = \frac{2\pi}{3} + 2\pi k$$

$$11) 3 \sec^2 x - 4 = 0$$

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

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

$$x = \frac{\pi}{6} \quad x = \frac{7\pi}{6}$$

$$x = \frac{5\pi}{6} \quad x = \frac{11\pi}{6}$$

$$13) 2 \sin^2 2x = 1$$

$$2x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$$

$$x = \frac{\pi}{8} + \pi k \quad x = \frac{5\pi}{8} + \pi k$$

$$x = \frac{3\pi}{8} + \pi k \quad x = \frac{7\pi}{8} + \pi k$$

$$15) 4 \sin^2 x - 3 = 0$$

$$x = \frac{\pi}{3} + 2\pi k$$

$$x = \frac{2\pi}{3} + 2\pi k$$

$$x = \frac{4\pi}{3} + 2\pi k$$

$$x = \frac{5\pi}{3} + 2\pi k$$

$$10) \tan x + 1 = 0$$

$$x = \frac{3\pi}{4} + \pi k$$

$$x = \frac{7\pi}{4} + \pi k$$

$$12) \csc^2 x - 2 = 0$$

$$\csc x = \pm \sqrt{2}$$

$$x = \frac{\pi}{4} + 2\pi k \quad x = \frac{5\pi}{4} + 2\pi k$$

$$x = \frac{3\pi}{4} + 2\pi k \quad x = \frac{7\pi}{4} + 2\pi k$$

$$14) \tan^2 3x = 3$$

$$3x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$$

$$x = \frac{\pi}{9} + \frac{\pi k}{3} \quad x = \frac{4\pi}{9} + \frac{\pi k}{3}$$

$$x = \frac{2\pi}{9} + \frac{\pi k}{3} \quad x = \frac{5\pi}{9} + \frac{\pi k}{3}$$

$$16) \sin x(\sin x + 1) = 0$$

$$x = 0 + 2\pi k \quad x = \frac{3\pi}{2} + 2\pi k$$

$$x = \pi + 2\pi k$$