

Simple Trig Equations

Solve each equation for $0 \leq \theta < 360$.

1) $\frac{1}{2} = \cos \theta$

2) $\tan \theta = -1$

3) $\sec(\theta + 45) = 1$

4) $\sin 4\theta = -\frac{2\sqrt{3}}{3}$

5) $\cot 2\theta = \frac{\sqrt{3}}{3}$

6) $-6\sqrt{3} = -9\csc 3\theta$

7) $\frac{3}{2} \cdot \tan(2\theta + 135) = -\frac{\sqrt{3}}{2}$

8) $-4\cos\left(150 + \frac{\theta}{4}\right) = 2\sqrt{3}$

$$9) 2 - \frac{1}{2} \cdot \sin(3\theta + 330) = \frac{8 - \sqrt{3}}{4}$$

$$10) -2 + \frac{1}{4} \cdot \cot(2\theta + 30) = -\frac{7}{4}$$

Find all solutions to each equation in radians.

$$11) \frac{1}{2} \cdot \sin \theta = -\frac{\sqrt{3}}{4}$$

$$12) \frac{2}{5} \cdot \cos \theta = \frac{\sqrt{2}}{5}$$

$$13) \frac{\sqrt{3}}{3} = \cot\left(\theta + \frac{\pi}{6}\right)$$

$$14) 2 = \csc\left(\theta + \frac{2\pi}{3}\right)$$

$$15) 4 + \sec 3\theta = 2$$

$$16) \frac{-15 + \sqrt{3}}{3} = -5 + \tan\left(\theta + \frac{3\pi}{4}\right)$$

Simple Trig Equations

Solve each equation for $0 \leq \theta < 360$.

1) $\frac{1}{2} = \cos \theta$

 $\{60, 300\}$

2) $\tan \theta = -1$

 $\{135, 315\}$

3) $\sec(\theta + 45) = 1$

 $\{315\}$

4) $\sin 4\theta = -\frac{2\sqrt{3}}{3}$

No solution.

5) $\cot 2\theta = \frac{\sqrt{3}}{3}$

 $\{30, 120, 210, 300\}$

6) $-6\sqrt{3} = -9\csc 3\theta$

 $\{20, 40, 140, 160, 260, 280\}$

7) $\frac{3}{2} \cdot \tan(2\theta + 135) = -\frac{\sqrt{3}}{2}$

 $\left\{7\frac{1}{2}, 97\frac{1}{2}, 187\frac{1}{2}, 277\frac{1}{2}\right\}$

8) $-4\cos\left(150 + \frac{\theta}{4}\right) = 2\sqrt{3}$

 $\{0, 240\}$

$$9) 2 - \frac{1}{2} \cdot \sin(3\theta + 330) = \frac{8 - \sqrt{3}}{4}$$

$$\{30, 50, 150, 170, 270, 290\}$$

$$10) -2 + \frac{1}{4} \cdot \cot(2\theta + 30) = -\frac{7}{4}$$

$$\left\{7\frac{1}{2}, 97\frac{1}{2}, 187\frac{1}{2}, 277\frac{1}{2}\right\}$$

Find all solutions to each equation in radians.

$$11) \frac{1}{2} \cdot \sin \theta = -\frac{\sqrt{3}}{4}$$

$$\left\{\frac{5\pi}{3} + 2\pi n, \frac{4\pi}{3} + 2\pi n\right\}$$

$$12) \frac{2}{5} \cdot \cos \theta = \frac{\sqrt{2}}{5}$$

$$\left\{\frac{\pi}{4} + 2\pi n, \frac{7\pi}{4} + 2\pi n\right\}$$

$$13) \frac{\sqrt{3}}{3} = \cot\left(\theta + \frac{\pi}{6}\right)$$

$$\left\{\frac{\pi}{6} + \pi n\right\}$$

$$14) 2 = \csc\left(\theta + \frac{2\pi}{3}\right)$$

$$\left\{-\frac{\pi}{2} + 2\pi n, \frac{\pi}{6} + 2\pi n\right\}$$

$$15) 4 + \sec 3\theta = 2$$

$$\left\{\frac{2\pi}{9} + \frac{2\pi n}{3}, \frac{4\pi}{9} + \frac{2\pi n}{3}\right\}$$

$$16) \frac{-15 + \sqrt{3}}{3} = -5 + \tan\left(\theta + \frac{3\pi}{4}\right)$$

$$\left\{-\frac{7\pi}{12} + \pi n\right\}$$