

Solve the equation on the interval of $[0, 2\pi]$

$$1. \cos 2\theta = -\frac{1}{2}$$

$$\frac{2\theta}{2} = \frac{120 \pm 360k}{2} \quad \frac{2\theta}{2} = \frac{240 \pm 360k}{2}$$

$$\theta = 60 \pm 180k \quad \theta = 120 \pm 180k$$

$$60, 240 \quad 120, 300$$

$$3. \sec \frac{3\theta}{2} = -2$$

$$\cos \frac{3\theta}{2} = -\frac{1}{2}$$

$$5. \cos \left(2\theta - \frac{\pi}{2} \right) = -1$$

$$2\theta - 90 = 180$$

$$2\theta = 270$$

$$\theta = 135^\circ$$

$$7. \tan \left(\frac{\theta}{2} + \frac{\pi}{3} \right) = 1$$

$$2. \tan 2\theta = -1$$

$$\frac{2\theta}{2} = \frac{135 \pm 180k}{2}$$

$$\theta = 67.5 \pm 90k$$

$$67.5, 157.5, 247.5, 337.5$$

$$\frac{x}{y} = -\sqrt{3}$$

$$4. \cot \frac{2\theta}{3} = -\sqrt{3}$$

$$\frac{2\theta}{3} = 150 \pm 180k$$

$$225 \pm 270$$

$$225$$

$$6. \sin \left(3\theta + \frac{\pi}{18} \right) = 1$$

$$3\theta + 10 = 90$$

$$3\theta = 80$$

$$\theta = \frac{80}{3}$$

$$\left(\frac{\pi}{18} \right) \frac{180}{\pi}$$

$$\frac{160}{18} = 10$$