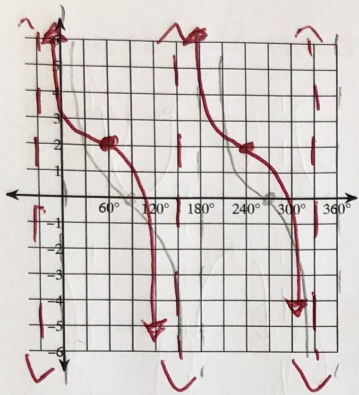


16) $y = 2 + \cot(\theta + 210)$

LEFT 210° (7)
UP 2



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

17) $-\cos \theta = -1$ PERIOD = 360°

$\cos \theta = 1$

$\theta = \cos^{-1}(1)$

$\theta = 0^\circ$

$360^\circ - 0^\circ = 360^\circ$

18) $\sqrt{2} = -2\cos 3\theta$ PERIOD = 120°

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

$\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right) = 3\theta$

$135^\circ = 3\theta$

$45^\circ = \theta$

$120^\circ - 45^\circ = 75^\circ$

+120°
105° 285°
195° 315°

19) $\frac{3}{2} = 1 + \sin \theta$ PERIOD = 360°

$\frac{1}{2} = \sin \theta$

$\sin^{-1}\left(\frac{1}{2}\right) = \theta$

$30^\circ = \theta$

$180^\circ - 30^\circ = 150^\circ$

20) $-\frac{7}{2} = -3 + \sin 3\theta$ PERIOD = 120°

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

$\sin^{-1}\left(-\frac{1}{2}\right) = 3\theta$

$-30^\circ = 3\theta$

$-10^\circ = \theta \xrightarrow{+120^\circ} 110^\circ = \theta$

$60^\circ - 10^\circ = 70^\circ$

110° } +120°...
70° }
230° 350°
190° 310°

Solve each equation for $0 \leq \theta < 2\pi$.

$$21) 4 + \sin \theta = \frac{8 + \sqrt{2}}{2} \text{ PERIOD} = 2\pi$$

$$\sin \theta = \frac{\sqrt{2}}{2}$$

$$\theta = \sin^{-1}\left(\frac{\sqrt{2}}{2}\right)$$

$$\boxed{\theta = \frac{\pi}{4}}$$

$$\pi - \frac{\pi}{4} \rightarrow \frac{4\pi}{4} - \frac{\pi}{4} = \boxed{\frac{3\pi}{4}}$$

$$23) -\frac{7}{2} = -3 + \cos \theta \text{ PERIOD} = 2\pi$$

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

$$\cos^{-1}\left(-\frac{1}{2}\right) = \theta$$

$$\boxed{\frac{2\pi}{3} = \theta}$$

$$2\pi - \frac{2\pi}{3} \rightarrow \frac{6\pi}{3} - \frac{2\pi}{3} = \boxed{\frac{4\pi}{3}}$$

Find all solutions to each equation in degrees.

$$25) 5 + \sin 2\theta = \frac{11}{2} \text{ PERIOD} = 180^\circ$$

$$\sin 2\theta = \frac{1}{2}$$

$$2\theta = \sin^{-1}\left(\frac{1}{2}\right)$$

$$2\theta = 30^\circ$$

$$\boxed{\theta = 15^\circ + 180^\circ n}$$

$$90^\circ - 15^\circ = \frac{75^\circ}{2}$$

$$\boxed{\theta = 75^\circ + 180^\circ n}$$

$$22) -4\sin -2\theta = 2 \text{ PERIOD} = -\pi$$

$$\sin -2\theta = -\frac{1}{2}$$

$$-2\theta = \sin^{-1}\left(-\frac{1}{2}\right)$$

$$-2\theta = -\frac{\pi}{6}$$

$$\boxed{\theta = \frac{\pi}{12}}$$

$$-\frac{\pi}{2} - \frac{\pi}{12} \rightarrow \frac{-6\pi}{12} - \frac{\pi}{12} = \frac{-7\pi}{12} \rightarrow \boxed{\frac{5\pi}{12}}$$

$$\left. \begin{array}{l} \frac{\pi}{12} \\ \frac{5\pi}{12} \end{array} \right\} + \pi \dots \begin{array}{l} \boxed{\frac{13\pi}{12}} \\ \boxed{\frac{17\pi}{12}} \end{array}$$

$$24) 3\sqrt{3} = 6\cos -4\theta \text{ PERIOD} = -\frac{\pi}{2}$$

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

$$\cos^{-1}\left(\frac{\sqrt{3}}{2}\right) = -4\theta$$

$$\frac{\pi}{6} = -4\theta$$

$$-\frac{\pi}{24} = \theta \rightarrow \boxed{\frac{11\pi}{24}}$$

$$-\frac{\pi}{2} - \frac{\pi}{24} \rightarrow \frac{-12\pi}{24} + \frac{\pi}{24} = \frac{-11\pi}{24} \rightarrow \boxed{\frac{\pi}{24}}$$

$$\left. \begin{array}{l} \frac{11\pi}{24} \\ \frac{\pi}{24} \end{array} \right\} + \frac{\pi}{2} \dots \begin{array}{l} \boxed{\frac{23\pi}{24}} \quad \boxed{\frac{35\pi}{24}} \quad \boxed{\frac{47\pi}{24}} \\ \boxed{\frac{13\pi}{24}} \quad \boxed{\frac{25\pi}{24}} \quad \boxed{\frac{37\pi}{24}} \end{array}$$

$$26) -\frac{2}{5} \cos -3\theta = \frac{\sqrt{2}}{5} \text{ PERIOD} = -120^\circ$$

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

$$-3\theta = \cos^{-1}\left(-\frac{\sqrt{2}}{2}\right)$$

$$-3\theta = 135^\circ$$

$$\boxed{\theta = -45^\circ + -120^\circ n}$$

$$-120^\circ - 45^\circ = \boxed{-75^\circ + -120^\circ n}$$

Find all solutions to each equation in radians.

27) $8\cos -4\theta = -4$ PERIOD = $-\frac{\pi}{2}$

$$\cos -4\theta = -\frac{1}{2}$$

$$-4\theta = \cos^{-1}\left(-\frac{1}{2}\right)$$

$$-4\theta = \frac{2\pi}{3}$$

$$\theta = -\frac{2\pi}{12} = \boxed{-\frac{\pi}{6} + \frac{-\pi}{2}n}$$

$$-\frac{\pi}{2} - \frac{-\pi}{6} \rightarrow \frac{-3\pi}{6} - \frac{-\pi}{6} = \frac{-2\pi}{6} = \boxed{\frac{-\pi}{3} + \frac{-\pi}{2}n}$$

28) $4\sin \frac{\theta}{3} = 2\sqrt{2}$ PERIOD = 6π

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

$$\frac{\theta}{3} = \sin^{-1}\left(\frac{\sqrt{2}}{2}\right)$$

$$\frac{\theta}{3} = \frac{\pi}{4}$$

$$\theta = \boxed{\frac{3\pi}{4} + 6\pi n}$$

$$3\pi - \frac{3\pi}{4} \rightarrow \frac{12\pi}{4} - \frac{3\pi}{4} = \boxed{\frac{9\pi}{4} + 6\pi n}$$

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

29) $5 + \csc \theta = 3$ PERIOD = 360°

$$\csc \theta = -2$$

$$\frac{1}{\sin \theta} = -2$$

$$\sin \theta = -\frac{1}{2}$$

$$\theta = \sin^{-1}\left(-\frac{1}{2}\right)$$

$$\theta = -30^\circ \xrightarrow{+360} \boxed{330^\circ}$$

$$180^\circ - 30^\circ = \boxed{210^\circ}$$

30) $\frac{1}{3} \cdot \sec \theta = -\frac{\sqrt{2}}{3}$ PERIOD = 360°

$$\sec \theta = -\sqrt{2}$$

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

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

$$\cos \theta = -\frac{\sqrt{2}}{2}$$

$$\theta = \cos^{-1}\left(-\frac{\sqrt{2}}{2}\right)$$

$$\theta = \boxed{135^\circ}$$

$$360^\circ - 135^\circ = \boxed{225^\circ}$$

32) $-3\cot \theta = -3$ PERIOD = 180°

$$\cot \theta = 1$$

$$\frac{1}{\tan \theta} = 1$$

$$\tan \theta = \frac{1}{1}$$

$$\theta = \tan^{-1}(1)$$

$$\theta = \boxed{45^\circ}$$

$$45^\circ + 180^\circ = \boxed{225^\circ}$$

31) $\frac{-9 - \sqrt{3}}{3} = -3 + \tan \theta$ PERIOD = 180°

$$\frac{-\sqrt{3}}{3} = \tan \theta$$

$$-30^\circ = \tan \theta$$

$$\downarrow +180^\circ$$

$$\boxed{150^\circ}$$

$$150^\circ + 180^\circ = \boxed{330^\circ}$$

