

Pg 494

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

$$\theta = \frac{\pi}{6}, \frac{5\pi}{6}$$

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

$$\theta = \frac{5\pi}{6}, \frac{11\pi}{6}$$

5.) $\cos \theta = 0$

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

2.) $\tan \theta = 1$

$$\theta = \frac{\pi}{4}, \frac{5\pi}{4}$$

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

$$\theta = \frac{5\pi}{6}, \frac{7\pi}{6}$$

6.) $\sin \theta = \frac{\sqrt{2}}{2}$

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

7.) $\sin(3\theta) = -1$

$3\theta = \sin^{-1}(-1)$

$3\theta = \frac{3\pi}{6} + \frac{2\pi}{6}k$

$\theta = \frac{3\pi}{6} = \frac{\pi}{2} + \frac{\pi}{3}k$

$\theta = \frac{\pi}{2}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$

$\frac{1}{2} + \frac{1}{3} = \frac{5\pi}{6}; \frac{5}{6} + \frac{1}{3} = \frac{7\pi}{6}$

$\frac{7}{6} + \frac{1}{3}, \frac{9}{6}$

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

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

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

$\theta = \pi/3 + \pi k \quad \theta = 2\pi/3 + \pi k$
 $\theta = \pi/3, 4\pi/3, 2\pi/3, 5\pi/3$

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

$\frac{3\theta}{2} = \sec^{-1}(-2)$

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

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

$\theta = \frac{4\pi}{9} + \frac{4\pi k}{3} \quad \theta = \frac{8\pi}{9} + \frac{4\pi k}{3}$

$\theta = 4\pi/9, 16\pi/9, 8\pi/9$

13.) $\cos(2\theta - \pi/2) = -1$

$2\theta - \pi/2 = \cos^{-1}(-1)$

8.) $\tan \theta/2 = \sqrt{3}$

$\theta/2 = \tan^{-1}(\sqrt{3})$

$\theta/2 = \pi/3 + \pi \quad \theta/2 = 4\pi/3 + \pi$

$\theta = 2\pi/3 + 2\pi \quad \theta = 8\pi/3 + 2\pi$

$\theta = 2\pi/3$

10.) $\tan(2\theta) = -1$

$2\theta = \tan^{-1}(-1)$

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

$\theta = 3\pi/8 + \pi/2 \quad \theta = 7\pi/8 + \pi/2$

$\theta = 3\pi/8, 7\pi/8, 11\pi/8, 15\pi/8$

12.) $\cot(\frac{2\theta}{3}) = -\sqrt{3}$

$\frac{2\theta}{3} = \cot^{-1}(-\sqrt{3})$

$\frac{2\theta}{3} = \tan^{-1}(-\frac{1}{\sqrt{3}})$

$\frac{2\theta}{3} = \frac{5\pi}{6} + \pi k$

$\theta = \frac{15\pi}{12} + \frac{3\pi k}{2}$

$= 5\pi/4 + \frac{3\pi k}{2}$

$\theta = 5\pi/4$

$\frac{2\theta}{3} = \frac{11\pi}{6} + \pi$

$\theta = \frac{33\pi}{6} + \frac{3\pi}{2}$

$\theta = \frac{12\pi}{4} + \frac{3\pi}{2}$

14.) $\sin(3\theta + \pi/18) = 1$

$3\theta + \pi/18 = \sin^{-1}(1)$

$3\theta + \pi/18 = \frac{\pi}{2} + 2\pi k$
 $-\pi/18 \quad -\pi/18$

$3\theta = 8\pi/18 + 2\pi k$

$\theta = \frac{8\pi}{54} + \frac{2\pi k}{3}$

$\theta = \frac{4\pi}{27}, \frac{22\pi}{27}, \frac{40\pi}{27}$

$$15.) \tan\left(\frac{\theta}{2} + \frac{\pi}{3}\right) = 1$$

$$\frac{\theta}{2} + \frac{\pi}{3} = \tan^{-1}(1)$$

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

$$\frac{\theta}{2} = -\frac{\pi}{12} + \pi k$$

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

$$\theta = \frac{11\pi}{6}$$

$$\frac{\theta}{2} + \frac{\pi}{3} = \frac{5\pi}{4} + \pi k$$

$$\frac{\theta}{2} = \frac{11\pi}{12} + \pi k$$

$$\theta = \frac{11\pi}{6} + 2\pi k$$

$$\theta = \frac{11\pi}{6} + 2\pi k$$

$$16.) \cos\left(\frac{\theta}{3} - \frac{\pi}{4}\right) = \frac{1}{2}$$

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

$$\frac{\theta}{3} - \frac{\pi}{4} = \frac{\pi}{3} + 2\pi k \quad \frac{\theta}{3} - \frac{\pi}{4} = \frac{5\pi}{3}$$

$$\frac{\theta}{3} = \frac{7\pi}{12} + 2\pi k$$

$$\theta = \frac{7\pi}{4} + 6\pi k$$

$$\theta = \frac{7\pi}{4}$$

$$\frac{\theta}{3} = \frac{23\pi}{12} + 2\pi k$$

$$\theta = \frac{69\pi}{12} + 6\pi k$$

$$17.) 2 \sin \theta + 1 = 0$$

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

$$\theta = \frac{7\pi}{6}, \frac{11\pi}{6}$$

$$18.) \cos \theta + 1 = 0$$

$$\cos \theta = -1$$

$$\theta = \pi$$

$$19.) \tan \theta + 1 = 0$$

$$\tan \theta = -1$$

$$\theta = \frac{3\pi}{4}, \frac{7\pi}{4}$$

$$20.) \sqrt{3} \cot \theta + 1 = 0$$

$$\cot \theta = -\frac{1}{\sqrt{3}}$$

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

$$\theta = \frac{2\pi}{3}, \frac{5\pi}{3}$$

$$21.) 4 \sec \theta + 6 = -2$$

$$4 \sec \theta = -8$$

$$\sec \theta = -2$$

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

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

$$22.) 5 \csc \theta - 3 = 2$$

$$5 \csc \theta = 5$$

$$\csc \theta = 1$$

$$\sin \theta = 1$$

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

$$23.) 3\sqrt{2} \cos \theta + 2 = -1$$

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

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

$$\theta = \frac{3\pi}{4}, \frac{5\pi}{4}$$

$$24.) 4 \sin \theta + 3\sqrt{3} = \sqrt{3}$$

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

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

$$\theta = \frac{4\pi}{3}, \frac{5\pi}{3}$$

$$25.) \sin \theta = 0.4$$

$$\sin^{-1}(0.4) = \theta$$

$$\theta = 0.412$$

$$\theta \approx 2.730$$

$$\pi - 0.412$$

$$26.) \cos \theta = 0.6$$

$$\theta = \cos^{-1}(0.6)$$

$$\theta = 0.927$$

$$\theta = 5.356$$

$$2\pi - 0.927$$

$$27.) \tan \theta = 5$$

$$\theta = \tan^{-1}(5)$$

$$\theta \approx 1.373$$

$$\theta = 4.515$$

$$1.373 + \pi$$

$$28.) \cot \theta = 2$$

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

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

$$\theta \approx 0.464$$

$$\theta \approx 3.605$$

$$.464 + \pi$$

$$29.) \theta \approx 2.691$$

$$\theta \approx 3.593$$

$$2\pi - 2.691$$

$$30.) \theta \approx -0.201$$

$$\theta \approx 3.343$$

$$\pi - 0.201$$

$$31.) \theta \approx 1.823$$

$$\theta \approx 4.460$$

$$32.) \theta \approx 5.943$$

$$\theta \approx 3.481$$

$$-\pi - 0.340 + 2\pi$$

$$\pi - 0.340$$