

## Practice 14.2

1.  $2 \tan \theta + 2 = 0$

$$\tan \theta = -1$$

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

2.  $2 \cos \theta = 1$

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

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

3.  $2 \cos \theta + \sqrt{3} = 0$

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

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

4.  $\sqrt{3} \cot \theta - 1 = 0$

$$\cot \theta = \frac{\sqrt{3}}{3} = \frac{x}{y} = \frac{1}{\frac{\sqrt{3}}{2}}$$

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

5.  $4 \sin \theta - 3 = 0$

$$\sin \theta = \frac{3}{4}, \sin^{-1}\left(\frac{3}{4}\right) = \theta$$

$$\theta = 0.85 \text{ rad}, \theta = 2.29 \text{ rad}$$

$$6. \quad 4 \sin \theta + 3 = 0$$

$$\sin \theta = -\frac{3}{4}, \quad \sin^{-1}\left(-\frac{3}{4}\right) = \theta$$

$$\theta = -0.85 \text{ rad}, \quad \theta = 3.99 \text{ rad}$$

$$\theta = 5.44 \text{ rad}$$

↑ coterminal

$$7. \quad (2 \cos \theta + \sqrt{3})(2 \cos \theta + 1) = 0$$

$$2 \cos \theta + \sqrt{3} = 0$$

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

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

$$2 \cos \theta + 1 = 0$$

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

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

$$8. \quad \sqrt{3} \tan \theta - 2 \sin \theta \tan \theta = 0$$

$$\tan \theta (\sqrt{3} - 2 \sin \theta) = 0$$

$$\tan \theta = 0$$

$$\theta = 0, \pi$$

$$\sqrt{3} - 2 \sin \theta = 0$$

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

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

$$9. \quad 2 \cos^2 \theta + \cos \theta = 0$$

$$\cos \theta (2 \cos \theta + 1) = 0$$

$$\cos \theta = 0$$

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

$$2 \cos \theta + 1 = 0$$

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

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

10.  $5\cos\theta - 3 = 0$  (Solve for  $\theta$ )

$$\cos\theta = \frac{3}{5}, \cos^{-1}\left(\frac{3}{5}\right) = \theta$$

$$\theta = 0.93 \text{ rad}, \theta = 2.21 \text{ rad}$$

11.  $\tan\theta - 2\cos\theta\tan\theta = 0$

$$\tan\theta(1 - 2\cos\theta) = 0$$

$$\tan\theta = 0$$

$$\theta = 0, \pi$$

$$1 - 2\cos\theta = 0$$

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

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

12.  $\tan\theta(\tan\theta + 1) = 0$

$$\tan\theta = 0$$

$$\theta = 0, \pi$$

$$\tan\theta + 1 = 0$$

$$\tan\theta = -1$$

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

13.  $(\cos\theta - 1)(2\cos\theta - 1) = 0$

$$\cos\theta - 1 = 0$$

$$\cos\theta = 1$$

$$\theta = 0$$

$$2\cos\theta - 1 = 0$$

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

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

14.  $\tan^2\theta - \tan\theta = 0$

$$\tan\theta(\tan\theta - 1) = 0$$

$$\tan\theta = 0$$

$$\theta = 0, \pi$$

$$\tan\theta = 1$$

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

15. a)  $750 = -16(2)^2 + 1500(2) \sin \theta$

$$\sin \theta = \frac{814}{3000}$$

$$\theta = 15.74^\circ$$

b)  $750 = -16(3)^2 + 1500(3) \sin \theta$

$$\sin \theta = \frac{894}{4500}$$

$$\theta = 11.46^\circ$$

16.  $\tan^{-1}(2.5) = 1.19 \text{ rad}$

17.  $\sin^{-1}(0.75) = 0.85 \text{ rad}$

18.  $\cos^{-1}(-0.24) = 1.81 \text{ rad}$

19.  $\cos^{-1}(0.45) = 1.10 \text{ rad}$

20.  $\sin^{-1}\left(\frac{\sqrt{2}}{2}\right) = 45^\circ$

21.  $\tan^{-1}(1) = 45^\circ$

22.  $\cos^{-1}\left(\frac{\sqrt{2}}{2}\right) = 45^\circ$

23.  $\sin^{-1}(1) = 90^\circ$

24. input = -1  $\cos^{-1}(-1) = \pi$

25. input = 0  $\cos^{-1}(0) = \frac{\pi}{2}$  and  $\frac{3\pi}{2}$   
From graph