

6.8 → p. 509 #'s 11, 19, 33, 35, 45

$$11.) \sin^2 - \cos^2 = 1 + \cos$$

$$(1 - \cos^2) - \cos^2 = 1 + \cos$$

$$1 - 2\cos^2 = 1 + \cos$$

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

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

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

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

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

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

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

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

$$19.) \tan\theta = 2\sin\theta$$

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

$$\cos\theta \cdot \frac{\sin\theta}{\cos\theta} = 2\sin\theta \cdot \cos\theta$$

$$\sin\theta = 2\sin\theta \cos\theta$$

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

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

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

$$\theta = 0, \pi$$

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

$$33.) 3(1 - \cos\theta) = \sin^2\theta$$

$$3 - 3\cos\theta = 1 - \cos^2\theta$$

$$3 - 3\cos\theta - 1 + \cos^2\theta = 0$$

$$\cos^2\theta - 3\cos\theta + 2 = 0$$

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

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

$$\cos\theta = 2$$

No Solution

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

$$\cos\theta = 1$$

$$\theta = 0$$

$$35.) \tan^2\theta = \frac{3}{2}\sec\theta$$

$$2 \cdot \tan^2\theta = \frac{3}{2}\sec\theta \cdot 2$$

$$2\tan^2\theta = 3\sec\theta$$

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

$$2\sec^2\theta - 2 - 3\sec\theta = 0$$

$$2\sec^2\theta - 3\sec\theta - 2 = 0$$

$$(2\sec\theta + 1)(\sec\theta - 2) = 0$$

$$\frac{2\sec\theta}{2} = \frac{-1}{2} \quad \sec\theta = 2 \rightarrow \cos\theta = \frac{1}{2}$$

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

$$\cos\theta = -2 \rightarrow \text{NS}$$

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

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

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

$$45.) \sin \theta + \cos \theta = \sqrt{2}$$

* Since you can't sub in an identity, then try squaring each side.

$$(\sin \theta + \cos \theta)^2 = (\sqrt{2})^2$$

$$\sin^2 \theta + 2 \sin \theta \cos \theta + \cos^2 \theta = 2$$

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

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

$$2 \sin \theta \cos \theta = 1$$

$$\sin(2\theta) = 1$$

$$\sin u = 1$$

$$u = \frac{\pi}{2} + 2\pi k$$

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

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

$$k=0 \rightarrow \boxed{\frac{\pi}{4}}, k=1 \rightarrow \textcircled{\frac{5\pi}{4}}$$