

6.5 Homework John Vanghan

Solving Equations

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

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

$$K \in \mathbb{Z}$$

$$\cos \theta = \frac{1}{2} \quad \cos \theta = 0$$

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

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

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

2. $\sin^2 \theta - 1 = 0$

$$\sqrt{\sin^2 \theta} = \sqrt{1}$$

$$\sin \theta = \pm 1$$

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

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

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

4. $2 \cos^2 \theta + \cos \theta - 1 = 0$

$$(2 \cos \theta - 1)(\cos \theta + 1)$$

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

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

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

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

3. $2 \sin^2 \theta - \sin \theta - 1 = 0$

$$(2 \sin \theta + 1)(\sin \theta - 1)$$

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

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

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

$$\theta = \left\{ \frac{\pi}{6}, \frac{5\pi}{6}, \frac{\pi}{2} \right\}$$

$$5. (\tan \theta - 1)(\sec \theta - 1) = 0$$

$$\tan \theta = 1 \quad \sec \theta = 1$$

$$\theta = \frac{\pi}{4} + 2\pi k \quad \theta = 0 + 2\pi k$$

$$\theta = \pi + 2\pi k$$

$$\theta = \left\{ 0, \frac{\pi}{4}, \pi \right\}$$

$$6. \sin^2 \theta - \cos^2 \theta = 1 + \cos \theta$$

$$1 - 2\cos^2 \theta = 1 + \cos \theta \quad - \quad 8. \quad 2\sin^2 \theta = 3(1 - \cos \theta)$$

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

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

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

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

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

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

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

$$\cos \theta = 0$$

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

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

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

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

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

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

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

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

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

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

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

$$7. \sin^2 \theta = 6(\cos \theta + 1)$$

$$1 - \cos^2 \theta = 6\cos \theta + 6$$

$$1 - \cos^2 \theta - 6\cos \theta - 6 = 0$$

$$-\cos^2 \theta - 6\cos \theta - 5 = 0$$

$$\cos^2 \theta + 6\cos \theta + 5 = 0$$

$$(\cos \theta + 5)(\cos \theta + 1) = 0$$

~~$$\cos \theta = -5$$~~

$$\cos \theta = -1$$

$$\theta = \{ \pi \}$$