

Find all solutions to the equations in the interval $[0\pi, 2\pi)$. Then generalize your solutions.

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

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

3. $\sin 2\theta + \cos \theta = 0$

4. $\cos 2\theta + \cos \theta = 2$

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

6. $2\cos^2\theta - 7\cos\theta + 3 = 0$

7. $\sqrt{3} \tan \theta \sec \theta + 2 \tan \theta = 0$

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

9. $\cos^2 \theta - \sin^2 \theta = 2 \cos \theta - 1$

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

Answers:

1. $0\pi, \pi$

General solution: $k\pi$

2. $\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

General solution: $\frac{\pi}{3} + k\pi, \frac{2\pi}{3} + k\pi$

3. $\frac{\pi}{2}, \frac{3\pi}{2}, \frac{7\pi}{6}, \frac{11\pi}{6}$

General solution: $\frac{\pi}{2} + k\pi, \frac{7\pi}{6} + 2k\pi, \frac{11\pi}{6} + 2k\pi$

4. 0π

General solution: $2k\pi$

5. $\frac{2\pi}{3}, \frac{4\pi}{3}$

General solution: $\frac{2\pi}{3} + 2k\pi, \frac{4\pi}{3} + 2k\pi$

6. $\frac{\pi}{3}, \frac{5\pi}{3}$

General solution: $\frac{\pi}{3} + 2k\pi, \frac{5\pi}{3} + 2k\pi$

7. $0\pi, \pi, \frac{5\pi}{6}, \frac{7\pi}{6}$

General solution: $k\pi, \frac{5\pi}{6} + 2k\pi, \frac{7\pi}{6} + 2k\pi$

8. $\frac{\pi}{2}, \frac{3\pi}{2}$

General solution: $\frac{\pi}{2} + k\pi$

9. $0\pi, \frac{\pi}{2}, \frac{3\pi}{2}$

General solution: $\frac{\pi}{2} + k\pi, 2k\pi$

10. $0\pi, \pi, \frac{\pi}{6}, \frac{5\pi}{6}$

General solution: $k\pi, \frac{\pi}{6} + 2k\pi, \frac{5\pi}{6} + 2k\pi$