

Solving for Angles in Standard Position

Part I — Quadrant Reasoning

1. If both $\sin \theta$ and $\tan \theta$ are negative, determine the quadrant in which θ must terminate. Explain.
2. Suppose $\sin \theta = k$. For what value(s) of k will there be only ONE angle θ on the interval $0 \leq \theta < 2\pi$. Explain.

Part II — Solving Trig Equations

3. Solve for all θ on the interval $0 \leq \theta < 2\pi$

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

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

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

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

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

4. Solve for all θ on the interval $0 \leq \theta < 2\pi$

$$2\sin^2 \theta = 1$$

$$3\tan^2 \theta = 1$$

$$4\cos^2 \theta - 3 = 0$$

$$4\cos^2 \theta = 1$$

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

5. Solve for all θ on the interval $0 \leq \theta < 2\pi$

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

$$4\cos^2 \theta - 4\cos \theta - 3 = 0$$

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

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

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

6. Solve for all θ on the interval $0 \leq \theta < 2\pi$

$$\csc \theta = 2$$

$$\cot \theta = -1$$

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

$$\sec \theta = -2$$

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

7. Solve for all θ on the interval $0 \leq \theta < 2\pi$

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

$$\sin \theta + \cos \theta = 0$$

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

$$\csc \theta - \sqrt{2} = 0$$

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