

Warm-up #6: Solving Trig Equations

Ex. Solve: $[0, 2\pi)$

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

$$\sqrt{3}\sin\theta + \sin\theta\cot\theta = 0$$

$$\sin\theta(\sqrt{3} + \cot\theta) = 0$$

$$\sin\theta = 0 \quad \sqrt{3} + \cot\theta = 0$$

$$\cot\theta = -\sqrt{3}$$

~~$$\theta = 0, \pi$$~~

$$\boxed{\theta = \frac{5\pi}{6}, \frac{11\pi}{6}}$$

2. $-\sqrt{2}\csc\theta - 3\cot\theta = -\cot\theta$

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

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

$$\frac{-\sqrt{2}}{\sin\theta} - \frac{2\cos\theta}{\sin\theta} = 0$$

$$\frac{-\sqrt{2} - 2\cos\theta}{\sin\theta} = 0$$

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

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

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

$$\boxed{\theta = \frac{3\pi}{4}, \frac{5\pi}{4}}$$