

Warm-up #10: Solving Trig Equations

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

1. $3\csc\theta = \sqrt{3}\csc\theta\tan\theta$

$$3\csc\theta - \sqrt{3}\csc\theta\tan\theta = 0$$

$$\csc\theta(3 - \sqrt{3}\tan\theta) = 0$$

$$\csc\theta = 0 \quad 3 - \sqrt{3}\tan\theta = 0$$

$\sin = \emptyset$ ←
not possible

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

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

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

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

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

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

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

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

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

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

$$\sin\theta = 1$$

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

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

$$\theta = \frac{7\pi}{6}, \frac{11\pi}{6}$$