

5.9 Solving Trig Equations (No Factoring)

Essential Question:

How do I solve trig equations?

ex $\cos 4x \cos x - \sin 4x \sin x = 0$

ex $2 \sin x \cos x = 1$

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Essential Question: How do I solve trig equations?

$$1. \quad \frac{4 \cos^2 \theta = 3}{4} \quad \theta \in \{\text{real number degrees}\}$$

general solution

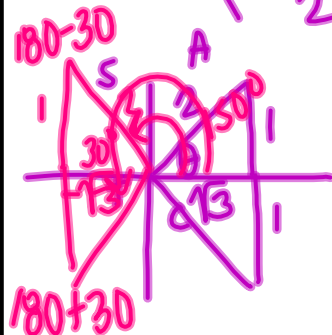
$$\sqrt{\cos^2 \theta} = \sqrt{\frac{3}{4}}$$

$$\sqrt{\quad} \rightarrow \pm$$

$$\cos \theta = \pm \sqrt{\frac{3}{4}}$$

$$\cos \theta = \pm \frac{\sqrt{3}}{2}$$

$$\cos^{-1}\left(\pm \frac{\sqrt{3}}{2}\right) = \theta$$



$$\begin{aligned} \textcircled{+} \quad & 30^\circ + 360n = \theta \\ & -30^\circ + 360n = \theta \\ & \text{or } 330^\circ \end{aligned} \quad \begin{aligned} \textcircled{-} \quad & 150^\circ + 360n = \theta \\ & 210^\circ + 360n = \theta \end{aligned}$$

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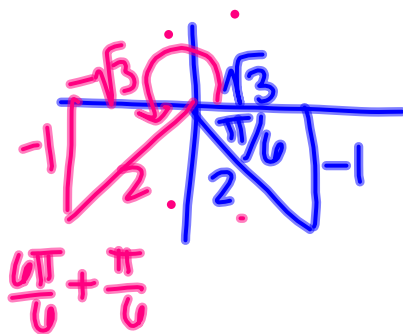
Essential Question: How do I solve trig equations?

$$2. \quad \sin x - 2 = 5 \sin x \quad x \in [0, 2\pi)$$

$$\frac{-2}{4} = \frac{4 \sin x}{4}$$

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

$$\sin^{-1}\left(-\frac{1}{2}\right) = x$$



$$-\frac{\pi}{6} + 2\pi n$$

$$\frac{7\pi}{6} + 2\pi n$$

$$-x - 2 = 5x$$

$$-2 = 4x$$

$$-\frac{\pi}{6} + \frac{12\pi}{6} = \frac{11\pi}{6}$$

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