

9.3


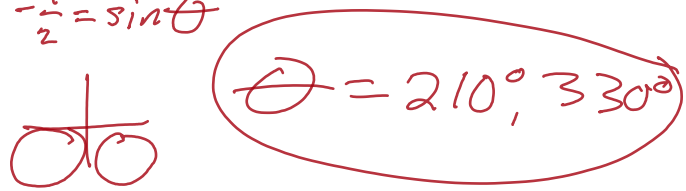

Date: 4/1/24

Objective: I can solve trig equations using the unit circle.

A. Warm-up: Solve each equation.

<p>1. $2x = -13x + 30$ $\frac{+13x \quad +13x}{15x = 30}$ $x = 2$</p>	<p>2. $14 = -4r - 4$ $\frac{+4 \quad +4}{18 = -4r}$ $r = -\frac{9}{2}$</p>
<p>3. $x^2 - 36 = -5x$</p>	<p>4. $5x = x^2$</p>

B. Solve each equation for $0 \leq \theta < 360$. (Remember: All Students Take Calculus **and** $\tan \theta = \frac{y}{x} = \frac{\sin \theta}{\cos \theta}$)

<p>1. $-5 + \cos \theta = -6$ $\frac{+5 \quad +5}{\cos \theta = -1}$  $180^\circ = \theta$</p>	<p>2. $4 = -8 \sin \theta$ $-\frac{1}{2} = \sin \theta$  $\theta = 210^\circ, 330^\circ$</p>
<p>3. $\left(\frac{\sqrt{3}}{3} = \frac{1}{3} \tan \theta \right) \frac{3}{1}$ $\sqrt{3} = \tan \theta$ $\theta = 120^\circ, 300^\circ$</p> <p>$\frac{y}{x} = -\frac{\sqrt{3}}{1}$ $(-1, \sqrt{3})$ $(1, -\sqrt{3})$</p>	<p>4. $3 + \sin \theta = 5$ $\frac{3 \quad -3}{\sin \theta = 2}$ no solution</p>
<p>5. $4 \sin \theta = -2\sqrt{2}$ $\frac{4}{4} \quad \frac{-2\sqrt{2}}{4}$ $\sin \theta = -\frac{\sqrt{2}}{2}$ $\theta = 225^\circ, 315^\circ$</p> <p>S A  $y = -\frac{\sqrt{2}}{2}$</p>	<p>6. $\sqrt{3} = -2 \cos \theta$</p>

C. Solve each equation for $0 \leq \theta < 2\pi$.

<p>1. $5 - 4 \tan \theta = 5$</p> $\begin{array}{r} 5 \\ -4 \tan \theta \\ \hline -4 \tan \theta = 0 \\ \tan \theta = 0 \\ \theta = 0, \pi \end{array}$ <p>$\frac{y}{x} = \frac{0}{1}$ (1, 0) (-1, 0)</p>	<p>2. $8 \cos \theta = 4\sqrt{2}$</p> $\begin{array}{r} 8 \\ \hline \cos \theta = \frac{\sqrt{2}}{2} \end{array}$ <p>$\theta = \frac{\pi}{4}, \frac{7\pi}{4}$</p> <p>$\frac{A}{C}$ $x = \frac{\sqrt{2}}{2}$</p>
<p>3. $-2 - 2 \sin \theta = -3$</p> $\begin{array}{r} -2 \\ +2 \\ \hline -2 \sin \theta = -1 \\ \sin \theta = \frac{1}{2} \\ \theta = \frac{\pi}{6}, \frac{5\pi}{6} \end{array}$ <p>$\frac{S}{A}$ $y = \frac{1}{2}$</p>	<p>4. $1 - \frac{1}{2} \sin \theta = \frac{1}{2}$</p>
<p>5. $-\sqrt{3} + 4 \cos \theta = \sqrt{3}$</p>	<p>6. $\sqrt{3} = 5\sqrt{3} + 8 \sin \theta$</p>
<p>7. $10 - 6 \tan \theta = 4$</p>	<p>8. $\frac{\pi}{3} + \tan \theta = \frac{4}{\sqrt{3}}$</p> $\begin{array}{r} \frac{\pi}{3} \\ -\frac{\pi}{3} \\ \hline \tan \theta = \frac{1}{\sqrt{3}} \\ \theta = \frac{\pi}{6}, \frac{7\pi}{6} \end{array}$ <p>$\frac{A}{T}$ $\frac{y}{x} = \frac{1}{\sqrt{3}}$ ($\sqrt{3}, 1$)</p>