Honors PreCalculus

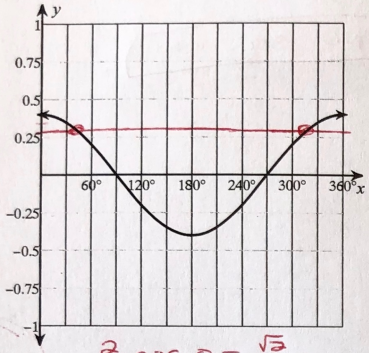
Name KEY

Solving Basic sin & cos equations - NOTES

Date _____ Period ____

Solve each equation for $0 \le \theta \le 360$.

1) $\frac{2}{5} \cdot \cos\theta = \frac{\sqrt{2}}{5}$



$\frac{\sqrt{2}}{5} \approx .28$

$\frac{2}{5}\cos\theta = \frac{\sqrt{2}}{5}$

$\div 2/5 \quad \div 2/5$

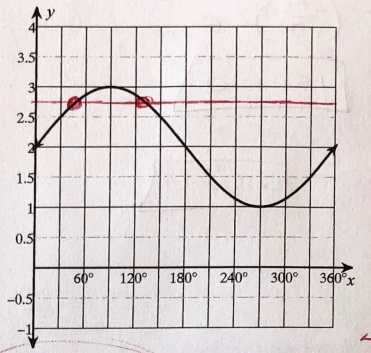
$\cos\theta = \frac{\sqrt{2}}{2}$

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

$45^\circ = \theta$

$360 - 45 = 315^\circ = \theta$

2) $2 + \sin\theta = \frac{4+\sqrt{2}}{2}$



$\frac{4+\sqrt{2}}{2} \approx 2.71$

$2 + \sin\theta = \frac{4+\sqrt{2}}{2}$

$-2 \qquad -2$

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

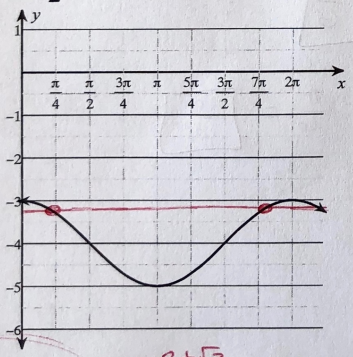
$\sin^{-1}\left(\frac{\sqrt{2}}{2}\right) = \theta$

$45^\circ = \theta$

$180 - 45^\circ = 135^\circ = \theta$

Solve each equation for $0 \le \theta \le 2\pi$

3) $\frac{-8+\sqrt{3}}{2} = -4 + \cos\theta$



$\frac{-8+\sqrt{3}}{2} \approx -3.13$

$\frac{-8+\sqrt{3}}{2} = -4 + \cos\theta$

$+4 \qquad +4$

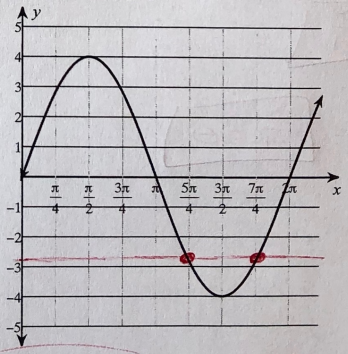
$\frac{\sqrt{3}}{2} = \cos\theta$

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

$\pi/6 = \theta$

$2\pi - \frac{\pi}{6} = \frac{11\pi}{6} = \theta$

4) $-2\sqrt{2} = 4\sin\theta$



$-2\sqrt{2} \approx -2.83$

$-2\sqrt{2} = 4\sin\theta$

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

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

$\frac{7\pi}{4} = \theta$

$\pi - \frac{7\pi}{4} = \frac{5\pi}{4} = \theta$

Solve each equation for $0 \le \theta < 360$.

5) $-2 + \cos\theta = \dfrac{-4 - \sqrt{3}}{2}$

$+2 \qquad +2$

$\cos\theta = \dfrac{-\sqrt{3}}{2}$

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

$150^\circ = \theta$

$360^\circ - 150^\circ = 210^\circ = \theta$

6) $3\sin\theta = -6$

$\dfrac{3\sin\theta}{3} = \dfrac{-6}{3}$

$\sin\theta = -2$

$\sin^{-1}(-2) = \theta$

NO SOLUTIONS

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

7) $\dfrac{-2 + \sqrt{2}}{2} = -1 + \sin\theta$

$+1 \qquad +1$

$\dfrac{\sqrt{2}}{2} = \sin\theta$

$\theta = \sin^{-1}\left(\dfrac{\sqrt{2}}{2}\right)$

$\theta = \dfrac{\pi}{4}$

$\pi - \dfrac{\pi}{4} = \dfrac{3\pi}{4} = \theta$

8) $-\dfrac{\sqrt{3}}{2} = -\cos\theta$

$+1$

$\dfrac{\sqrt{3}}{2} = \cos\theta$

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

$\theta = \dfrac{\pi}{6}$

$2\pi - \dfrac{\pi}{6} = \dfrac{11\pi}{6}$