Pre Calculus

Name Key

Solve Trig Equations 4.7/5.2

where K is an integer

Solve each equation

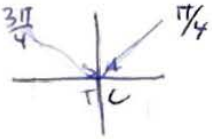
1) $\sin\theta = 1$

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

2) $-1 = \cos\theta$

$\theta = \pi + 2\pi K$

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



$\theta = \frac{\pi}{4} + 2\pi K$

$\theta = \frac{3}{4}\pi + 2\pi K$

4) $\csc\theta = 2$

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

$\theta = \frac{\pi}{6} + 2\pi K$

$\theta = \frac{5}{6}\pi + 2\pi K$

Solve each equation for the value of x.

5) $1 + 2\cos\theta = -1$

$\cos\theta = -1$

$\theta = \pi + 2\pi K$

6) $-5 + 4\cot\theta = -9$

$4\cot\theta = -4$

$\cot\theta = -1$

$\tan\theta = -1$

$\theta = \frac{3}{4}\pi + \pi K$

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

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

7) $2 + 4\sin\left(\theta + \frac{2\pi}{3}\right) = 2$

sin of 0

$4\sin(\theta + \frac{2}{3}\pi) = 0$

$\sin(\theta + \frac{2}{3}\pi) = 0$

$\theta + \frac{2}{3}\pi = 0$

$\theta = -\frac{2}{3}\pi$

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

$\theta + \frac{2}{3}\pi = \pi$

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

8) $1 - 2\tan\left(\theta + \frac{\pi}{2}\right) = -1$

$-2\tan(\theta + \frac{\pi}{2}) = -2$

$\tan(\theta + \frac{\pi}{2}) = +1$

$\theta + \frac{\pi}{2} = \frac{\pi}{4}$

9) $5 = 5 - 3\cos\frac{\theta}{2}$

for cos

$0 = \cos\frac{\theta}{2}$

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

$\frac{\theta}{2} = \frac{3}{2}\pi$

$\theta = 3\pi$

10) $-4 = -5 - 2\cos 4\theta$

$1 = -2\cos 4\theta$

$-\frac{1}{2} = \cos 4\theta$

$4\theta = \frac{2\pi}{3}$ $\quad \theta = \frac{\pi}{6}$

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

Solve each equation for the value of x, round your answer to 2 decimal places.

11) $-2 = -1 + \frac{5}{2}\cdot\cos\theta$

$-1 = \frac{5}{2}\cos\theta$

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

$\theta = 1.98$

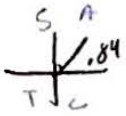
$\theta = 4.30$

$\pi - 1.98 \rightarrow$

12) $-6 = -3 - 4\sin\theta$

$-3 = -4\sin\theta$

$\frac{3}{4} = \sin\theta$



$\theta = .848$

$\pi - .848 \rightarrow$ $\theta = 2.29$

Pre Calculus

Name _____

Solve Trig Equations Section 5.3 #1

Solve each equation for all values.

1) $\sec\theta = -1$

$\cos\theta = \frac{1}{-1} = -1$

$\theta = \pi + 2\pi k$ where $k \in \mathbb{Z}$

2) $-1 = \cos\theta$

$\theta = \pi + 2\pi k$ where $k \in \mathbb{Z}$

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

$\theta = \frac{\pi}{4} + 2\pi k$

$\theta = \frac{3\pi}{4} + 2\pi k$

4) $\csc^2\cdot\theta = 2$

$\csc\theta = \pm\sqrt{2}$

$\sin\theta = \pm\frac{1}{\sqrt{2}} = \pm\frac{\sqrt{2}}{2}$

$\theta = \frac{\pi}{4} + 2\pi k$, where $k \in \mathbb{Z}$

Solve each equation for the value of x.

5) $6 = 5 + \tan^2\cdot\theta$

$1 = \tan^2\theta$

$\pm 1 = \tan\theta$

$\theta = \pi/4$

$\theta = \frac{\pi}{4} + k\pi$, k is int.

$\theta = \frac{3\pi}{4} + k\pi$

6) $1 = 1 - \frac{1}{3}\cdot\cot\theta$

$0 = -\frac{1}{3}\cot\theta$

$0 = \cot\theta$

$\theta = \frac{\pi}{2} + k\pi$ where k is an integer

7) $-5 - 3\cot\theta = -5$

$-3\cot\theta = 0$

$\cot\theta = \frac{0}{1} : 0$

$\tan\theta = \frac{1}{0}$:

$\theta = \frac{\pi}{2} + k\pi$ k is integer

8) $1 - 2\sec\theta = 5$

$-2\sec\theta = 4$

$\sec\theta = -2$

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

$\theta = \frac{2\pi}{3} + 2\pi k$, $k \in \mathbb{Z}$

$\theta = \frac{4\pi}{3} + 2\pi k$

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

9) $4 + 3\tan^2\cdot 4\theta = 13$

$3\tan^2 4\theta = 9$

$\tan^2 4\theta = 3$

$\tan 4\theta = \pm\sqrt{3}$

Period $\frac{2\pi}{4} = \frac{\pi}{2}$

$4\theta = \frac{\pi}{3} + k\pi$

$\theta = \frac{\pi}{12} + \frac{k\pi}{4}$

$\theta = \frac{\pi}{12} + \frac{3\pi k}{12}$

$\theta = \frac{\pi}{12}, \frac{\pi}{3}, \frac{5\pi}{6}, \frac{13\pi}{12}, \frac{4\pi}{3}, \frac{19\pi}{12}, \frac{11\pi}{6}$

10) $-1 = 2 + 3\tan\frac{\theta}{2}$

$-3 = 3\tan\theta/2$

$-1 = \tan\theta/2$

$k \cdot \frac{\theta}{2} = \frac{3\pi}{4}$

Period $\frac{\pi}{2}$

$\theta = \frac{3\pi}{2}$

11) $-8 = -4 - 8\cos -2\theta$

$-4 = -8\cos 2\theta$

$\frac{1}{2} = \cos 2\theta$

$2\theta = \frac{\pi}{3}, \frac{5\pi}{3}, \frac{7\pi}{3}, \frac{11\pi}{3}$

Period 4π

$\theta = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$

12) $-4 + \frac{1}{3}\cdot\sin\frac{\theta}{2} = -4$

$-\frac{1}{3}\sin\theta/2 = 0$

$\sin\theta/2 = 0$

Period $\frac{2\pi}{\frac{1}{2}} = 4\pi$

$\theta/2 = 0, \pi$

$\theta = 0, 2\pi$

$\theta = 0$