

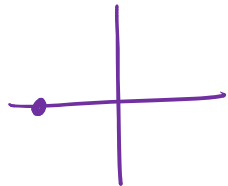
Trig Honors
Chapter 6 Part 2 Review

Name:

Solve for x over the indicated interval.

1. $\sec x + 1 = 0$ $[0, 2\pi]$

$\sec x = -1$
 $\cos x = -1$



$x = \pi$

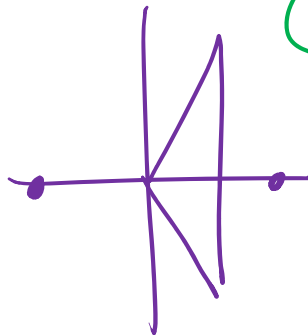
2. $\sqrt{7} \cos x - 3 = 0$ all solutions

$\cos x = \frac{3}{\sqrt{7}} > 1$

No solution

3. $\tan x \sec x = 2 \tan x$ $[-90^\circ, 90^\circ]$

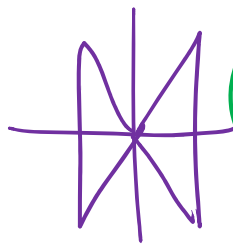
$\tan x \sec x - 2 \tan x = 0$
 $\tan x (\sec x - 2) = 0$
 $\tan x = 0$ $\sec x = 2$
 $\cos x = \frac{1}{2}$



$x = 0^\circ, 60^\circ, -60^\circ$

4. $4 \cos^2 x - 1 = 0$ all solutions

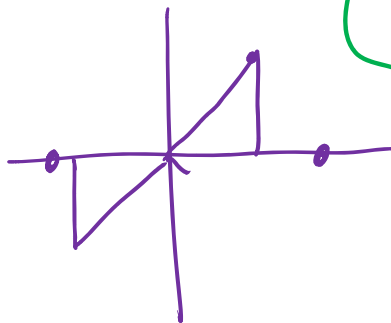
$\cos^2 x = \frac{1}{4}$
 $\cos x = \pm \frac{1}{2}$



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

5. $\tan x \sin x - \sin x = 0$ all solutions

$\sin x (\tan x - 1) = 0$
 $\sin x = 0$ $\tan x = 1$



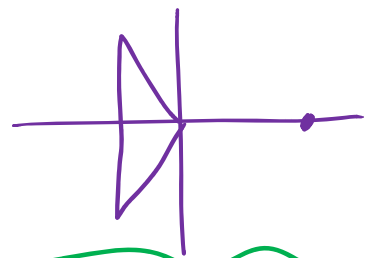
$x = 0 + \pi k,$
 $\frac{\pi}{4} + \pi k$
 $k \in \mathbb{Z}$

6. $2\cos^2 x = \cos x + 1$ $[-2\pi, 2\pi]$ $\left[-\frac{6\pi}{3}, \frac{6\pi}{3}\right]$

$$2\cos^2 x - \cos x - 1 = 0$$

$$(2\cos x + 1)(\cos x - 1) = 0$$

$$\cos x = -\frac{1}{2}, 1$$



$$x = 0, 2\pi, \frac{2\pi}{3}, \frac{4\pi}{3}, -\frac{2\pi}{3}, -\frac{4\pi}{3}$$

7. $4\sin^2 x = 11\sin x + 3$ $[-180^\circ, 180^\circ]$

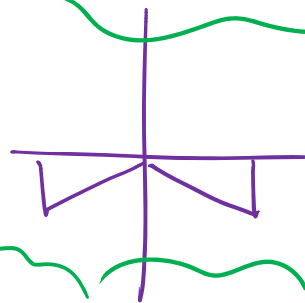
$$4\sin^2 x - 11\sin x - 3 = 0$$

$$(4\sin x + 1)(\sin x - 3) = 0$$

$$\sin x = -\frac{1}{4} \quad \sin x = 3$$

NO SOL.

$$\beta = \sin^{-1}\left(\frac{1}{4}\right) = 14^\circ$$



$$x = -14^\circ, -166^\circ$$

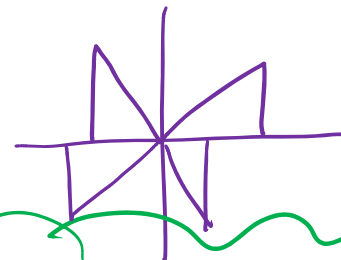
8. $2\cot^2 x - \cot x - 1 = 0$ $[-180^\circ, 360^\circ]$

$$(2\cot x + 1)(\cot x - 1) = 0$$

$$\cot x = -\frac{1}{2} \quad \cot x = 1$$

$$\tan x = -2 \quad \tan x = 1$$

$$\beta = \tan^{-1}(2) = 63^\circ$$



$$x = 45^\circ, 225^\circ, -135^\circ, 117^\circ, 297^\circ, -63^\circ$$

9. $2\cos^2 x + 3\sin x = 0$ $[-\pi, \pi]$ $\left[-\frac{6\pi}{6}, \frac{6\pi}{6}\right]$

$$2(1 - \sin^2 x) + 3\sin x = 0$$

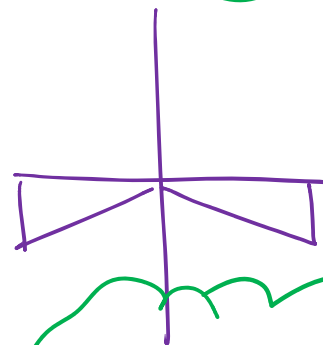
$$2 - 2\sin^2 x + 3\sin x = 0$$

$$2\sin^2 x - 3\sin x - 2 = 0$$

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

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

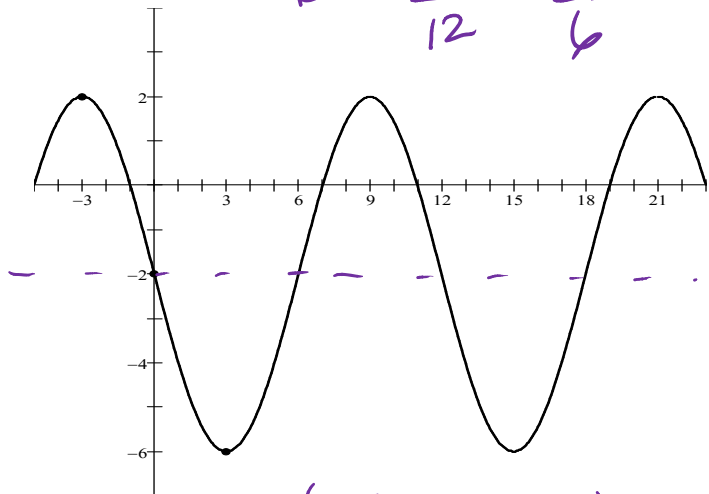
NO SOLUTION



$$x = -\frac{5\pi}{6}, -\frac{\pi}{6}$$

10. Write the particular equation of the graph.

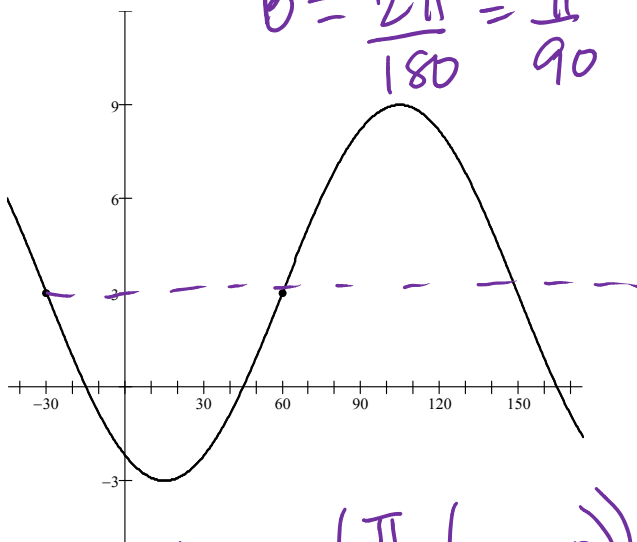
$$B = \frac{2\pi}{12} = \frac{\pi}{6}$$



$$y = 4 \cos\left(\frac{\pi}{6}(x+3)\right) - 2$$

11. Write the particular equation of the graph.

$$B = \frac{2\pi}{180} = \frac{\pi}{90}$$

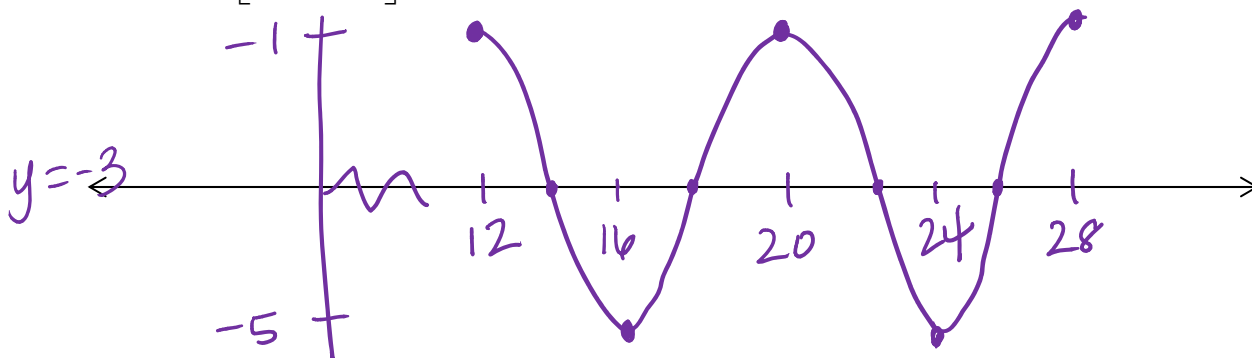


$$y = 6 \sin\left(\frac{\pi}{90}(x-60)\right) + 3$$

Sketch two periods of the following equations.

12. $y = 2 \cos\left[\frac{\pi}{4}(x-12)\right] - 3$

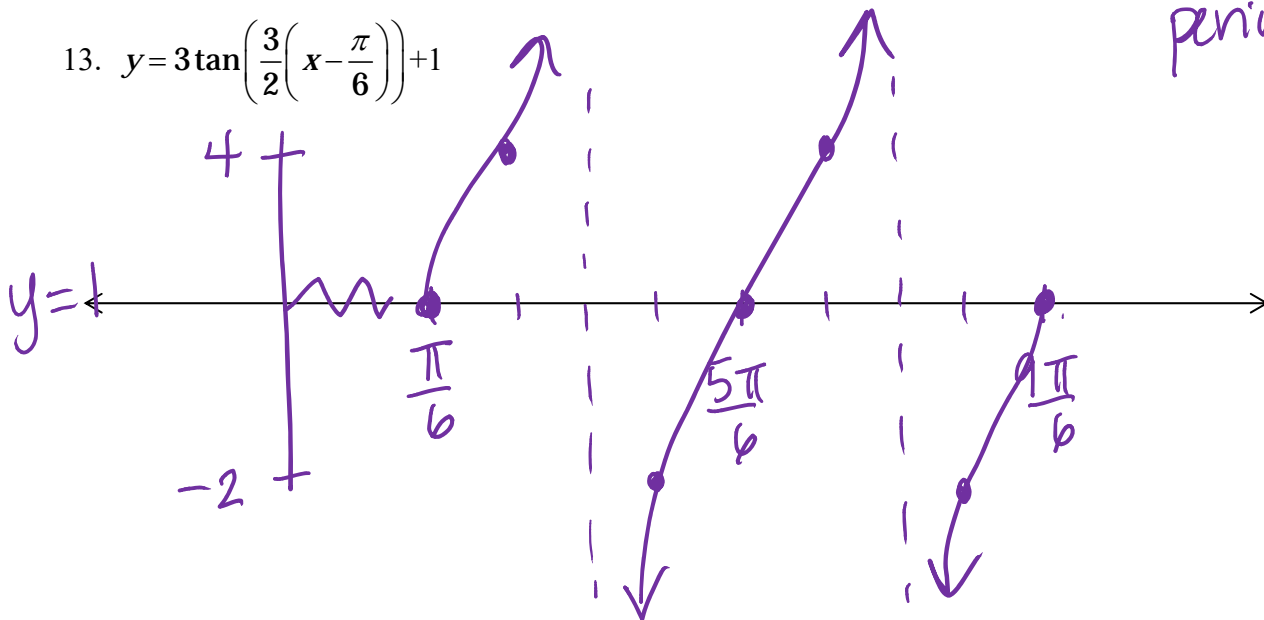
$$\text{period} = \frac{2\pi}{\frac{\pi}{4}} = 8$$



13. $y = 3 \tan\left(\frac{3}{2}\left(x - \frac{\pi}{6}\right)\right) + 1$

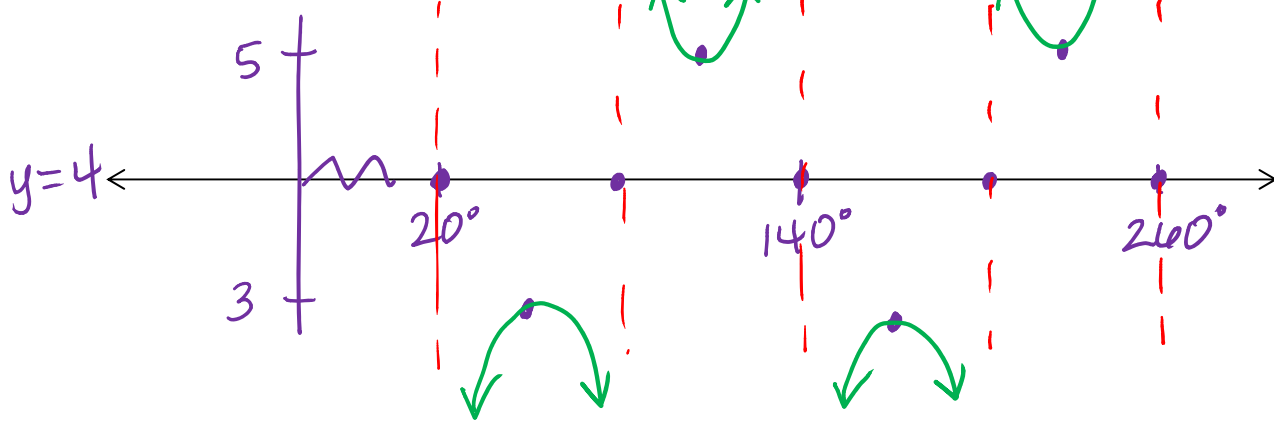
$$\text{period} = \frac{\pi}{\frac{3}{2}} = \frac{2\pi}{3}$$

$$= \frac{4\pi}{6}$$



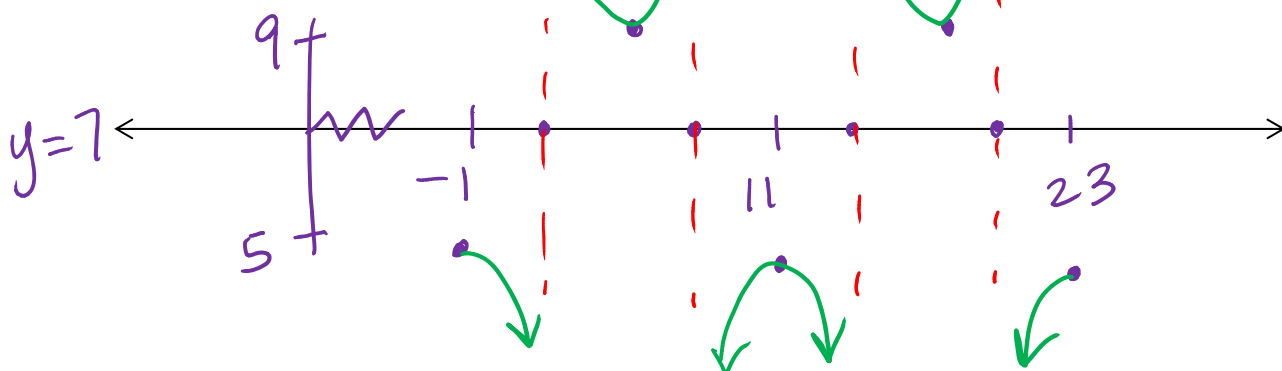
$$14. y = 4 - \csc[3\theta - 60^\circ] = -\csc[3(\theta - 20^\circ)] + 4$$

$$\text{period} = \frac{360^\circ}{3} = 120^\circ$$



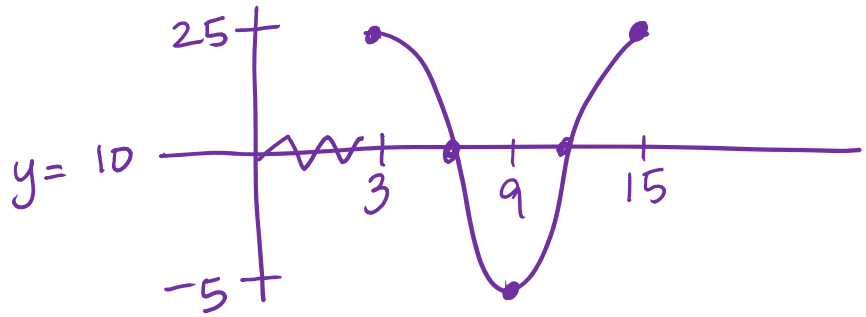
$$15. y = -2\sec\left[\frac{\pi}{6}(x+1)\right] + 7$$

$$\text{period} = \frac{2\pi}{\frac{\pi}{6}} = 12$$



16. While a contestant on Fear Factor, your task is to be attached to the side of a large spinning wheel where you must find the correct key in order to make the wheel stop. Unfortunately, part of the wheel is underwater at all times. The diameter of the wheel is 30 feet, the maximum height obtained is 25 feet and it takes 12 seconds for one revolution. While spinning around on the wheel, you realize that your distance above the water varies sinusoidally with time. After spinning in the wheel for 3 seconds, you are at the maximum height.

a. Sketch the graph of this function.



b. Write the equation of the sinusoid.

c. List the first three times you are at a height of 21 feet.

$$y = 15 \cos\left(\frac{\pi}{6}(t-3)\right) + 10$$

$$t = 1.57 \text{ s}, 4.43 \text{ s}, 13.57 \text{ s}$$