

**Hw 11.3**

1. Answer the following questions about the graph of  $f(\theta)$  pictured to the right.

a. Which trigonometric function is  $f(\theta)$ ?

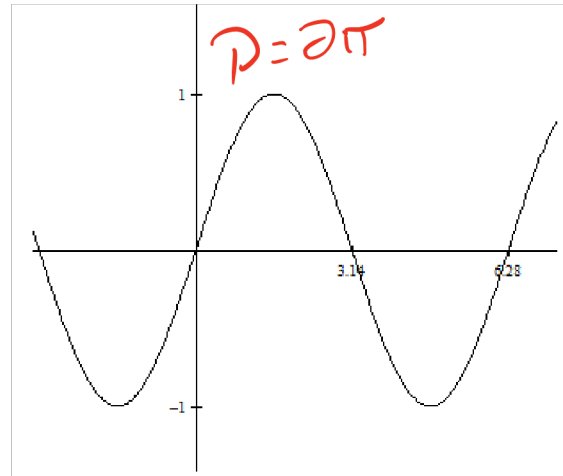
$f(\theta) = \sin \theta$

b. What is the amplitude of the function  $g(\theta) = 2f\left(\frac{1}{2}\theta\right) + 3$ ?

$Amp = |2| = 2$

c. What is the period of the function  $g(\theta) = 2f\left(\frac{1}{2}\theta\right) + 3$ ?

$Period = 4\pi$



2. Answer the following questions about the graph of  $f(\theta)$  pictured to the right.

a. Which trigonometric function is  $f(\theta)$ ?

$f(\theta) = \csc \theta$

b. What is the range of the function  $g(\theta) = 3f(2\theta) - 2$ ?

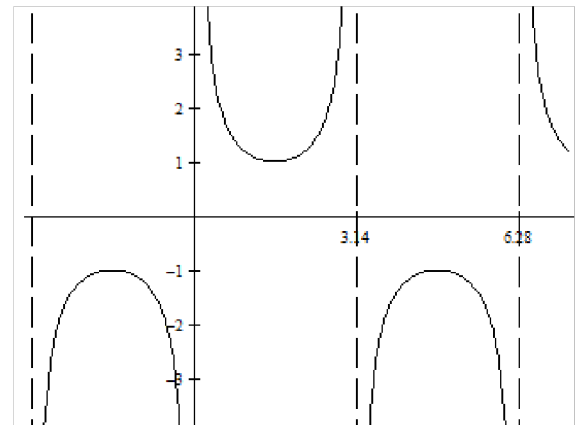
$y = [-5, -2]$

$P = (-\infty, -5] \cup [1, \infty)$

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c. What is the period of the function  $g(\theta) = 3f(2\theta) - 2$ ?

$P = \pi$



3. Answer the following questions about the graph of  $f(\theta)$  pictured to the right.

a. Which trigonometric function is  $f(\theta)$ ?

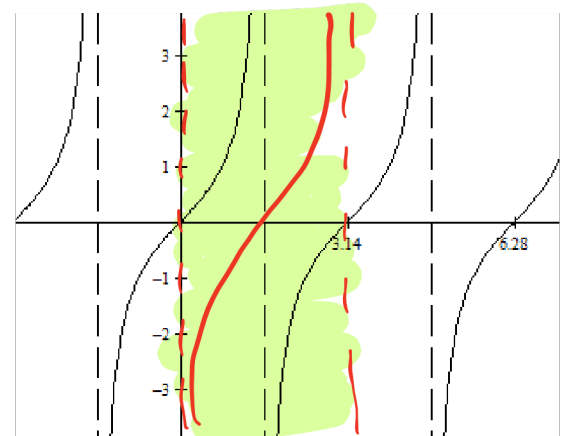
$f(\theta) = \tan \theta$

b. What is the period of the function  $g(\theta) = 3f\left(\frac{1}{3}\theta\right) - 2$ ?

$P = 3\pi$

c. Write a function,  $h(\theta)$ , that would transform  $f(\theta)$  into its reciprocal trig function.

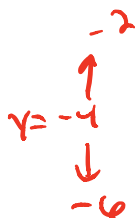
$h(\theta) = -f\left(\theta - \frac{\pi}{2}\right)$



For exercises 4 – 7, identify the range of each of the following functions.

4.  $f(\theta) = 2 \cos(\theta - \pi) - 4$

$R = [-6, -2]$

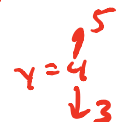


5.  $g(\theta) = \sec(\theta - \pi) + 4$

$R = (-\infty, 3] \cup [5, \infty)$



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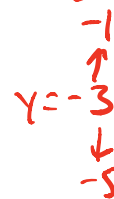
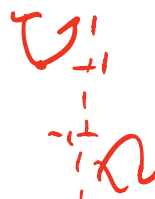


6.  $h(\theta) = 2 \tan(\theta - \pi) - 4$

$R = (-\infty, \infty)$

7.  $h(\theta) = 2 \csc(\theta - \pi) - 3$

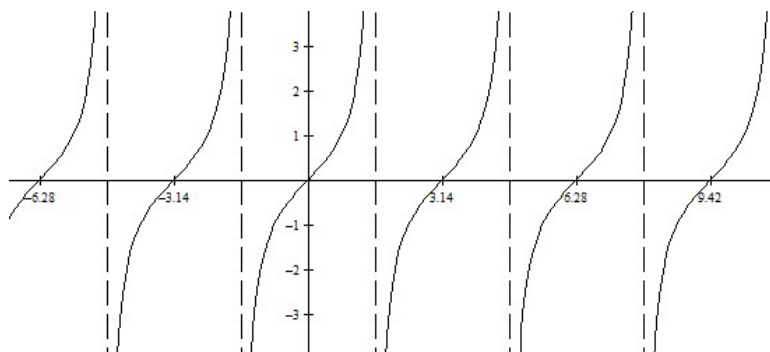
$R = (-\infty, -5] \cup [-1, \infty)$



Pictured below is the graph of a trigonometric function,  $f(\theta)$ . Use the graph to determine if the following statements are true or false. Give explanation for your reasoning.

8. The graph of the function is of  $f(\theta) = \cot \theta$ .

False  $f(\theta) = \tan \theta$



9. The period of the function  $g(\theta) = 2f(2\theta)$  is  $2\pi$ .

False,  $P = \pi \cdot \frac{1}{2} = \frac{\pi}{2}$

$g(\theta)$  has a horizontal dilation of  $\frac{1}{2}$

10. The domain of the function  $h(\theta) = f\left(\theta + \frac{\pi}{2}\right)$  is  $(-\infty, \infty)$  except for  $x = k\pi$ , where  $k$  is any integer.

True,  $f(\theta)$  has VA at  $\left(\frac{\pi}{2} + k\pi\right)$  when  $k \in \mathbb{Z}$   
 $h(\theta)$  translate VA left  $\frac{\pi}{2}$

11.  $\lim_{\theta \rightarrow -\frac{11\pi}{2}} f(\theta) = -\infty$

False  $\lim_{x \rightarrow -\frac{11\pi}{2}^-} f(\theta) = \infty$   
 $\lim_{x \rightarrow -\frac{11\pi}{2}^+} f(\theta) = -\infty$   
 $\lim_{x \rightarrow -\frac{11\pi}{2}^-} f(\theta) \neq \lim_{x \rightarrow -\frac{11\pi}{2}^+} f(\theta)$