

1. Given  $\cot\theta = \frac{1}{7}$  find the other five trigonometric ratios. Rationalize denominators and simplify.

$\sin\theta =$

$\cos\theta =$

$\tan\theta =$

$\sec\theta =$

$\csc\theta =$

2. State the location of five x-intercepts and five Vertical Asymptotes of this function:  $\tan\frac{6x}{7}$

x-int:

VA:

3. Sketch the graph one period of the function below. Label the coordinates of all points on the midline, all max's, and all min's.

$$y = -4\sin\left(3\left(x + \frac{\pi}{6}\right)\right) - 1$$

(1) Given:  $\cot \theta = \frac{1}{7}$

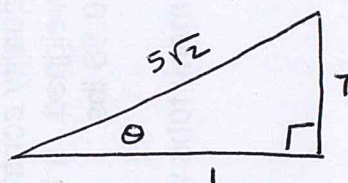
$$\tan \theta = \frac{7}{1}$$

$$\sin \theta = \frac{7}{5\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{7\sqrt{2}}{10}$$

$$\cos \theta = \frac{1}{5\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{10}$$

$$\csc \theta = \frac{5\sqrt{2}}{7}$$

$$\sec \theta = 5\sqrt{2}$$

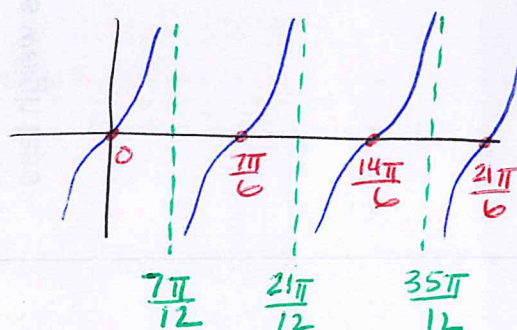


$$\begin{aligned} \text{HYPOTENUSE} &= \sqrt{7^2 + 1^2} \\ &= \sqrt{50} \\ &= 5\sqrt{2} \end{aligned}$$

(2)  $y = \tan \frac{6x}{7}$  period =  $\frac{\pi}{\frac{6}{7}} = \frac{7\pi}{6}$

X-INT:  $0, \pm \frac{7\pi}{6}, \pm \frac{14\pi}{6}$

VA:  $x = \pm \frac{7\pi}{12}, \pm \frac{21\pi}{12}, \pm \frac{35\pi}{12}$



(3)  $y = -4 \sin(3(x + \frac{\pi}{6})) - 1$

Amplitude = 4

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

upside down

midline:  $y = -1$

phase shift:  $\frac{\pi}{6}$  left

$$\frac{1}{4} \text{ period} = \frac{1}{4} \left( \frac{2\pi}{3} \right) = \frac{\pi}{6}$$

