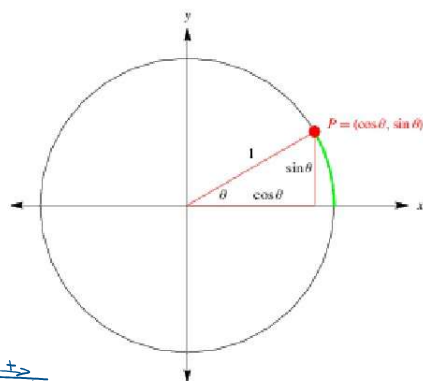


Reciprocal Trigonometry Functions

- $\csc\theta = \frac{1}{\sin\theta} = \frac{1}{y}$
- $\sec\theta = \frac{1}{\cos\theta} = \frac{1}{x}$
- $\cot\theta = \frac{1}{\tan\theta} = \frac{\cos\theta}{\sin\theta} = \frac{x}{y}$



Examples:

- What is the exact value of $\sec\left(-\frac{\pi}{6}\right)$?

$$= \frac{1}{\cos\left(-\frac{\pi}{6}\right)} = \frac{1}{\frac{\sqrt{3}}{2}} = \frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$$

- What is the decimal value of each expression? Round to the nearest thousandth.

$$\circ \cot(-34^\circ) \approx -1.48 \quad \frac{1}{\tan(-34^\circ)} = \frac{\cos(-34^\circ)}{\sin(-34^\circ)}$$

$$\circ \csc\left(\frac{5\pi}{8}\right) \approx 1.08$$

$$\circ \sec(1.2) \approx 2.76$$

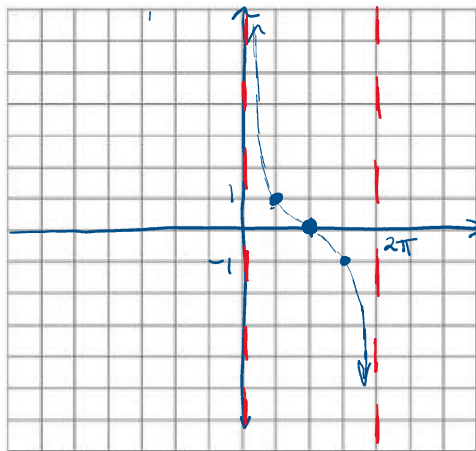
- What is the graph of $y = \cot\frac{1}{2}x$ in the interval from 0 to 2π ?

amplitude: 1

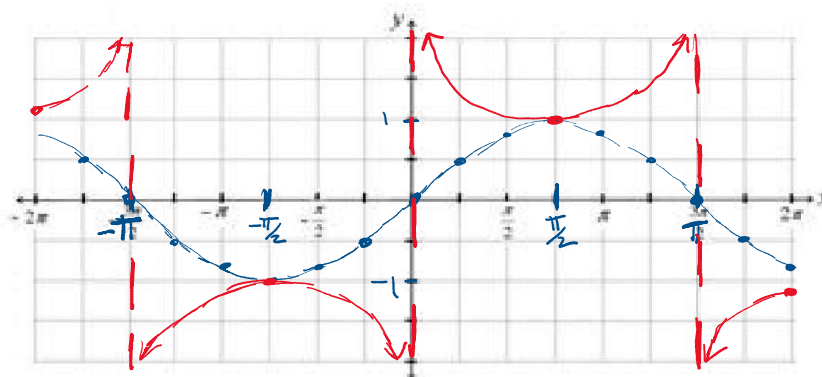
$$b = \frac{1}{2}$$

$$pd = \frac{\pi}{\frac{1}{2}} = 2\pi$$

$$\cot x = \frac{\cos x}{\sin x}$$



- Graph $y = \csc x$.



- A seaman is standing atop a ship's watchtower that stands 115 ft. above the water's surface in the center of the ship. He is using a spotting scope at that height to search the waters around the ship. The equation that represents the distance, y , from the center of the ship along the water to any object the seaman spots is given by $y = 115 \cot \theta$, where θ is the angle of depression from the seaman to the object. If the seaman spots two objects, one at an angle of depression of 4° and the other at an angle of depression of 11° , how far are the spotted objects from the center of the ship, rounded to the nearest foot?