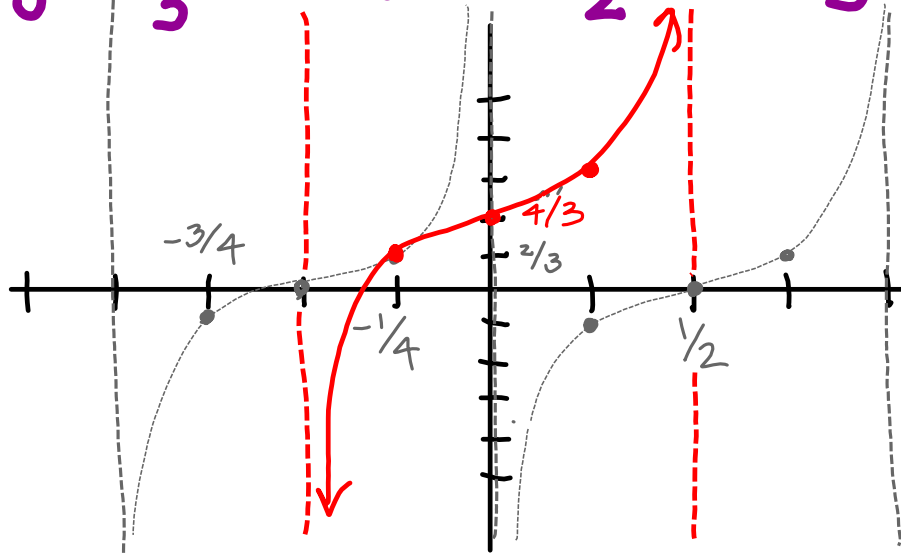


$$y = -\frac{2}{3} \cot\left(\pi x + \frac{\pi}{2}\right) + \frac{4}{3}$$



period: $\frac{\pi}{\pi} = 1$
 "amp": $2/3$
 h. shift: left $1/2$ (2 ticks)
 v. shift: up $4/3$ (2 ticks)

The wheels on my Segway have 4-inch diameters. If I travel 5 miles per hour, what is the angular speed in rev/min?

$r = 2 \text{ in}$; $v = \frac{5 \text{ mi}}{\text{h}}$; $\omega = ? \frac{\text{rev}}{\text{min}}$; $v = r\omega$

$$\omega = v \cdot \frac{1}{r} = \frac{5 \text{ mi}}{\text{h}} \cdot \frac{1}{2 \text{ in}} \cdot \frac{5280 \text{ ft}}{1 \text{ mi}} \cdot \frac{12 \text{ in}}{1 \text{ ft}} \cdot \frac{1 \text{ h}}{60 \text{ min}} \cdot \frac{1 \text{ rev}}{2\pi}$$

$$= \frac{1320}{\pi} \text{ rev/min}$$



Prove:

1.
$$\frac{\tan x - \sin x}{2 \tan x} = \sin^2 \frac{x}{2}$$

2.
$$\frac{1 + \cos^2 x}{\sin^2 x} = 2 \csc^2 x - 1$$

3.
$$\frac{\tan x + \cot x}{\csc x} = \sec x$$

4.
$$\cos^4 x - \sin^4 x = \cos 2x$$

5.
$$\sec 2\theta = \frac{\sec^2 \theta}{2 - \sec^2 \theta}$$

6.
$$\frac{2 \tan \theta}{1 + \tan^2 \theta} = \sin 2\theta$$

7.
$$\frac{\sin x + \cos x}{\sec x + \csc x} = \frac{\sin x}{\sec x}$$