

Develop
4 Trig.
functions
to describe
this
graph.

Amp = 1

$$\begin{aligned} \text{Per} &= \frac{5\pi}{12} - \left(-\frac{\pi}{4}\right) \\ &= \frac{5\pi}{12} + \frac{3\pi}{12} \\ &= \frac{8\pi}{12} \\ &= \frac{2\pi}{3} \end{aligned}$$

Ver. Shift = Up 1

$$\begin{aligned} \text{Per} &= \frac{2\pi}{K} \\ \frac{2\pi}{3} &= \frac{2\pi}{K} \\ K &= 3 \end{aligned}$$

$$y = 1 \sin\left[3\left(\theta - \frac{\pi}{4}\right)\right] + 1$$

$$y = -1 \sin\left[3\left(\theta + \frac{\pi}{12}\right)\right] + 1$$

$$y = 1 \cos\left[3\left(\theta + \frac{\pi}{4}\right)\right] + 1$$

$$y = -1 \cos\left[3\left(\theta - \frac{\pi}{12}\right)\right] + 1$$

Pg. 253
#15, 16

$$\text{Per} = \frac{2\pi}{K}$$

$$K = \frac{2\pi}{\text{Per}}$$

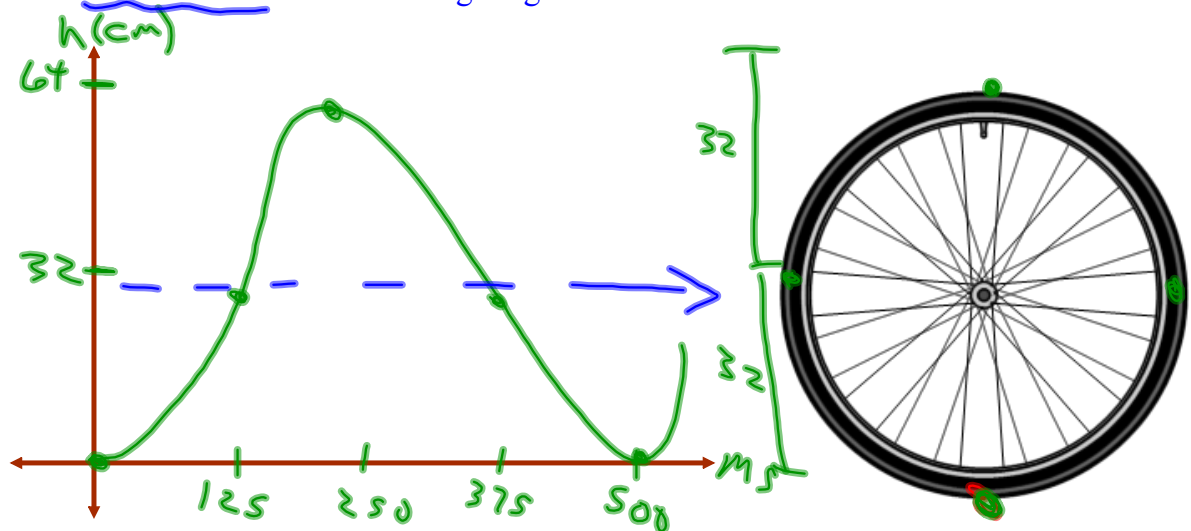
Applications of Sinusoidal Relations

- Strategy: (1) Translate ALL key pieces of information from the problem.
 (2) Draw a sketch with ALL key points identified.
 (3) Develop an equation that models the problem.
 (4) Answer the question(s) being asked.

CHECK??? Do the numbers make sense?

EXAMPLE...

Johnny is driving his bike when a tack becomes stuck in his tire. The tire has a radius of 32 cm and makes one complete rotation every 500 ms. How high will the tack be above the ground 12.38 seconds after becoming lodged in his tire???



$$V. \text{ shift} = +32$$

$$\text{amp} = 32$$

$$\text{Per} = 500$$

$$y = -32 \cos(0.72t) + 32$$

$$500 = \frac{360^\circ}{k}$$

$$k = \frac{360^\circ}{500}$$

$$k = 0.72$$

$$12.38 \text{ s} \times \frac{10^3 \text{ ms}}{1 \text{ s}} = \underline{12380 \text{ ms}}$$

$$y = -32 \cos(0.72(12380 \text{ ms})) + 32$$

$$y = \underline{29.99 \text{ cm}}$$