

A child rocks back and forth on a porch swing with an amplitude of  $0.204\text{m}$  and a period of  $2.80\text{s}$ . Assuming the motion to be SHM

1) write an equation for the speed.

2) determine maximum speed.

1)

$$A = 0.204\text{m}$$

$$T = 2.80\text{s}$$

$$\text{SHM} \rightarrow v = -Aw \sin(\omega t)$$

$$\omega = \frac{2\pi}{T}$$

$$v = (-0.204\text{m}) \left( \frac{2\pi}{2.80\text{s}} \right) \sin \left( \frac{2\pi}{2.80\text{s}} t \right)$$

$$v = -0.458 \text{ m/s} \sin \left( 2.24 \frac{1}{\text{s}} t \right)$$

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2)

$$V = -0.458 \text{ m/s} \sin\left(2.24 \frac{1}{\text{s}} t\right)$$

sin has a max of 1

$\Rightarrow$

$$V_{\max} = 0.458 \text{ m/s}$$