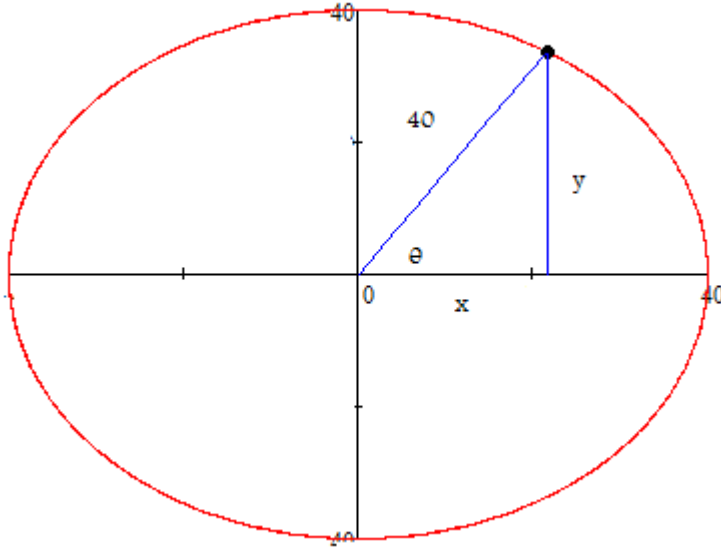


Suppose a ferris wheel with radius of 40 ft is rotating at a rate of 20rad/min. [See Animation -Ferris Wheel](#)

How fast is a person rising when the person is 10 ft above the horizontal?



$$\sin(\theta) = \frac{y}{40}$$

$$y = 40 \cdot \sin(\theta)$$

$$\frac{dy}{dt} = 40 \cdot \cos(\theta) \cdot \frac{d\theta}{dt}$$

$$\text{When } y = 10 \quad x = \sqrt{40^2 - 10^2} = 38.7 \quad \text{and } \cos(\theta) = .968$$

$$\frac{dy}{dt} = 40 \cdot 0.968 \cdot 20 = 774.4 \frac{\text{ft}}{\text{min}} = 8.8 \text{mph}$$