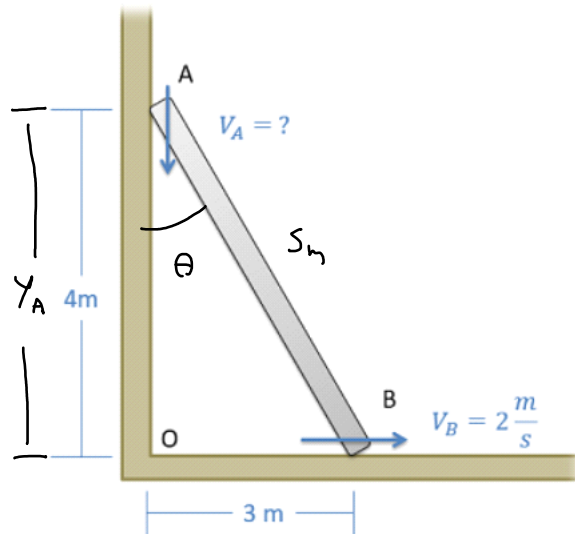


Problem 3

A ladder is propped up against a wall as shown below. If the base of the ladder is sliding out at a speed of 2 m/s, what is the speed of the top of the ladder?



$$x_B = 5 \sin \theta$$

$$y_B = y_A - 5 \cos \theta = 0$$

$$y_A = 4 \rightarrow \theta = 36.87^\circ$$

$$\dot{x}_B = 5 \cos(\theta) \dot{\theta} = 2 \text{ m/s} \rightarrow \dot{\theta} = .5 \text{ rad/s}$$

$$\dot{y}_B = \dot{y}_A + 5 \sin(\theta) \dot{\theta} = 0$$

$$\dot{y}_A = -5 \sin(\theta) \dot{\theta} = \boxed{-1.5 \text{ m/s}}$$

\uparrow
 38.87°