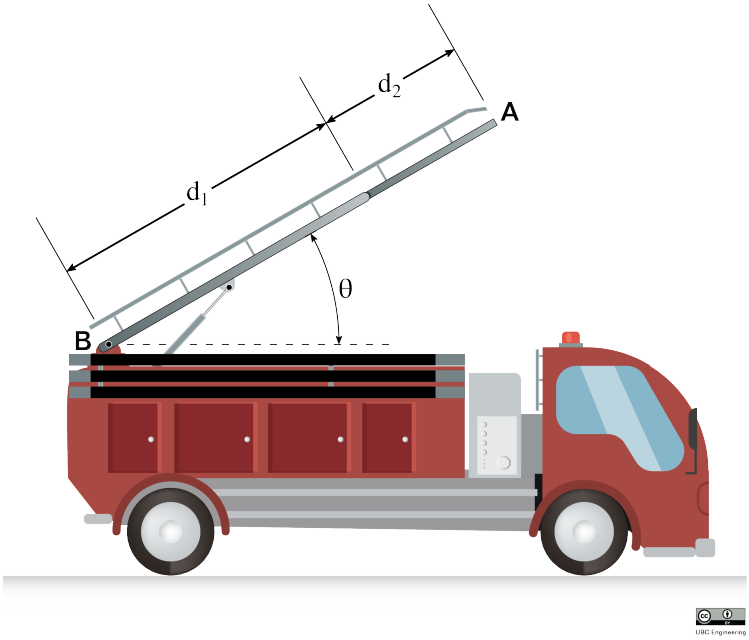
22-R-KM-TW-2



The fire truck is in the process of raising its ladder. It is able to increase the angle at a rate of 0.04 rad/s. If the combined length of d_1 and d_2 is 3 m, what is the rate at which the height of the ladder at point A is increasing when $\theta = 45°$?

Solution:

$$\sin\theta = \frac{h}{d}$$

$$\frac{d}{dt}\sin\theta = \frac{d}{dt}\cdot\frac{h}{d}$$

$$\omega\cos\theta = \frac{\dot{h}}{d}$$

$$v = \dot{h} = \omega d\cos\theta$$

$$v = (0.04)(3)\cos(45°) = 0.085 \text{ m/s}$$