

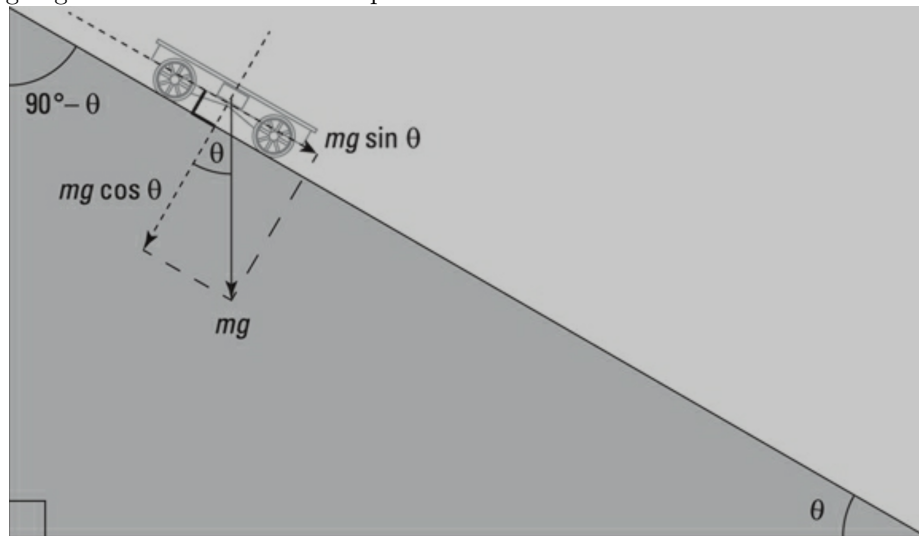
Cart Rolling Down Ramp

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1 Problem

Here, a cart is about to roll down a ramp. The cart travels not only vertically but also horizontally along the ramp, which is inclined at an angle θ . Say that $\theta = 30^\circ$ and that the length of the ramp is 5.0 meters. How fast will the cart be going at the bottom of the ramp?



Holzner, Steven. Physics I For Dummies (For Dummies (Math & Science)) (pp. 100-101). Wiley. Kindle Edition.

2 Solution

$$\theta = 30^\circ$$

$$s = 5m$$

$$mg \sin(30) = F_{ramp}$$

$$F_{ramp} = ma$$

$$ma = mg \sin(\theta)$$

$$a = g \sin(\theta)$$

$$a = g \sin(\theta) = \frac{v_f}{t}$$

$$s = \frac{v_f t}{2}$$

$$5 = \frac{v_f t}{2}$$

$$\frac{10}{v_f} = t$$

Taking from the equation we derived in the above.

$$g \sin(\theta) = \frac{v_f}{t}$$

$$9.8 \sin(30) = \frac{v_f^2}{10}$$

$$v_f = 7.0 m/s$$