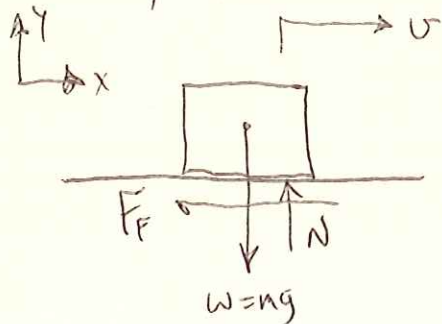


PROB. 12-5

$t = 9^s$, $x_f - x_0 = 30^m$, $v_f = 0$, FIND v_0 , μ



$$\sum F_y = ma_y$$

$$N - W = 0$$

$$N = W = mg$$

$$\sum F_x = ma_x$$

$$-F_f = ma_x$$

$$F_f = \mu N = \mu mg$$

$$-\mu mg = ma_x$$

$$a_x = -\mu g$$

$$a_x = \frac{dv_x}{dt} = -\mu g$$

$$dv_x = -\mu g dt$$

$$v - v_0 = -\mu g t \Rightarrow v_0 = v_f + \mu g t$$

$$v = \frac{dx}{dt} = v_0 - \mu g t$$

$$dx = (v_0 - \mu g t) dt$$

$$x - x_0 = v_0 t - \frac{1}{2} \mu g t^2$$

$$x_f - x_0 = (v_f + \mu g t) t - \frac{1}{2} \mu g t^2$$

PROB. 12-5 CONT.

$$X_f - X_0 = V_f \cdot t + \frac{1}{2} \mu g t^2$$

$$\mu = \frac{2}{g t^2} \left[(X_f - X_0) - \cancel{V_f t} \right]$$

$$\mu = \frac{2(30\text{m})}{\left(9.81 \frac{\text{m}}{\text{s}^2}\right) (9\text{s})^2} = 0.0755$$

$$V_0 = \cancel{V_f} + \mu g t$$

$$V_0 = (0.0755) \left(9.81 \frac{\text{m}}{\text{s}^2}\right) (9\text{s}) = 6.667 \frac{\text{m}}{\text{s}}$$