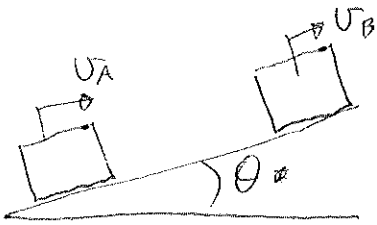
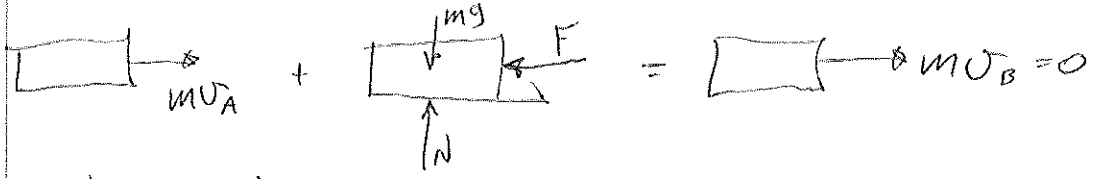
PROB. 13-121



$v_A = 30 \frac{ft}{s}$, $\mu_K = 0.3$, $v_B = 0$

FIND Δt FOR $\theta = 0, 20°$

a) $m\vec{v}_A + \Sigma \vec{Imp}_{A-B} = m\vec{v}_B$

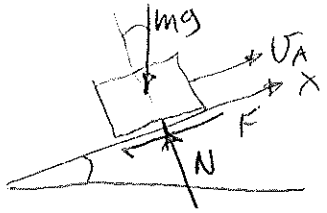


$\vec{Imp}_{A-B} = \vec{F} \cdot \Delta t$, $F = \mu N = \mu mg$

$mv_A - \mu mg \Delta t = 0$

$$\Delta t = \frac{v_A}{\mu g} = \frac{(30 \frac{ft}{s})}{(0.3)(32.2 \frac{ft}{s^2})} = 3.105^s$$

b)



$mv_A - (mg \sin\theta + F)\Delta t = 0$

$F = \mu N = \mu mg \cos\theta$

$mv_A - (mg \sin\theta + \mu mg \cos\theta)\Delta t = 0$

$$\Delta t = \frac{v_A}{g(\sin\theta + \mu \cos\theta)}$$

$$\Delta t = \frac{(30 \frac{ft}{s})}{(32.2 \frac{ft}{s^2})[\sin 20° + (0.3)(\cos 20°)]} = 1.493^s$$