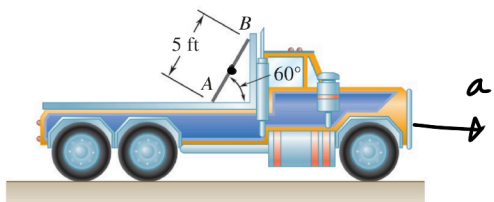
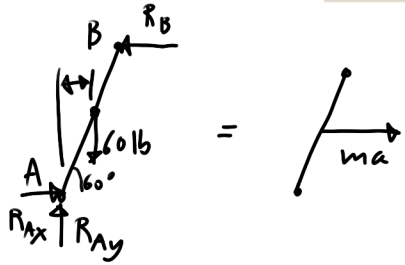
A 60-lb uniform thin panel is placed in a truck with end A resting on a rough horizontal surface and end B supported by a smooth vertical surface. Knowing that the panel remains in the position shown, determine (a) the maximum allowable acceleration of the truck, (b) the corresponding minimum required coefficient of static friction at end A.



$R_B = 0$



$\Sigma F_x = m a_x$

$\Sigma M_G = I\alpha$ $\quad \alpha = 0$

$\Sigma M_G = r\,ma$

$\Sigma M_A = 0$

$60\text{ lb}(2.5\text{ ft})\cos 60^\circ = (2.5\text{ ft})\sin 60\,(60\text{ lb})\,\dfrac{a}{32.2\text{ ft/s}^2}$

$\dfrac{(60\text{ lb})(5\text{ ft})\cos 60^\circ}{(5\text{ ft})\sin 60\,(60\text{ lb})} = a$

$32.2\text{ ft/s}^2 \dfrac{\cos 60}{\sin 60} = \boxed{18.6\text{ ft/s}^2}$

$\Sigma F_y = m a_y$ ($a_y = 0$)

$R_{Ay} - 60\text{ lb} = 0$

$R_{Ay} = 60\text{ lb}$

$\Sigma F_x = m a_x$

$R_{Ax} = \dfrac{60\text{ lb}}{32.2\text{ ft/s}^2}\,18.6\text{ ft/s}^2$

$= 34.7\text{ lb}$

$F = N\mu_s$

$34.7\text{ lb} = 60\text{ lb}\,\mu_s$

$\dfrac{34.7}{60\text{ lb}} = \boxed{0.58 = \mu_s}$