

6/28 (a) P to the right.

$\sum M_B = 0: mg \frac{l}{2} \cos \theta - N_A l \cos \theta + \mu_s N_A l \sin \theta = 0 \quad (1)$   
 (Box)  $\sum F_x = 0: P - \mu_s N_A - \mu_s N = 0 \quad (2)$   
 $\sum F_y = 0: N - m_o g - N_A = 0 \quad (3)$   
 Solve for P as  

$$P = \mu_s g \left[ \frac{m \cos \theta}{\cos \theta - \mu_s \sin \theta} + m_o \right]$$

(b) P to the left. Reverse P and all friction forces in the above FBD's & obtain

$$P = \mu_s g \left[ \frac{m \cos \theta}{\cos \theta + \mu_s \sin \theta} + m_o \right]$$

With  $\theta = 30^\circ$ ,  $m = m_o = 3 \text{ kg}$ , and  $\mu_s = 0.60$ ,  
 we obtain  $\begin{cases} (a) P = 44.7 \text{ N} \\ (b) P = 30.8 \text{ N} \end{cases}$