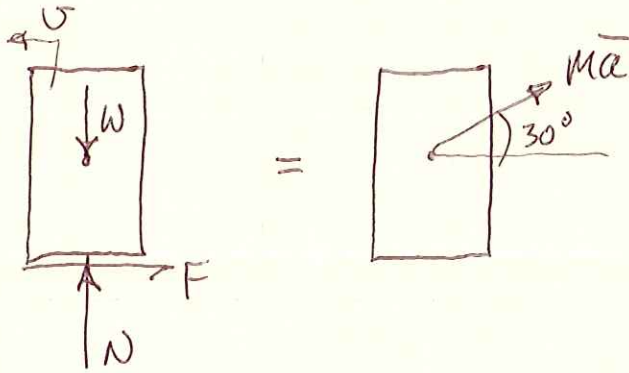


PROB. 16-11

$\mu_s = 0.25$, FIND a FOR CAN TO SLIDE,
 h/d FOR CAN TO TIP.



$$\Sigma F_x = ma_x : F = \mu N = \left(\frac{W}{g}\right) a \cos 30^\circ$$

$$\Sigma F_y = ma_y : N - W = ma \cdot \sin 30^\circ$$

$$N = W + \left(\frac{W}{g}\right) a \sin 30^\circ = W \left[1 + \left(\frac{a}{g}\right) \sin 30^\circ \right]$$

$$\mu W \left[1 + \left(\frac{a}{g}\right) \sin 30^\circ \right] = \left(\frac{W}{g}\right) a \cos 30^\circ$$

$$\mu + \left(\frac{\mu}{g} \cdot \sin 30^\circ\right) a = \left(\frac{1}{g} \cdot \cos 30^\circ\right) a$$

$$a \left(\frac{\mu}{g} \cdot \sin 30^\circ - \frac{1}{g} \cdot \cos 30^\circ \right) = -\mu$$

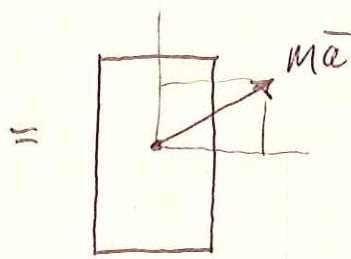
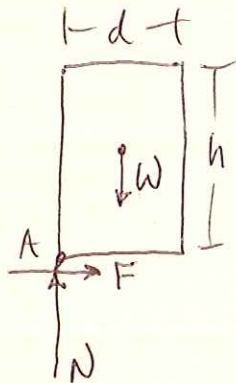
$$a \cdot \frac{1}{g} (\cos 30^\circ - \mu \sin 30^\circ) = \mu$$

$$a = \frac{g \cdot \mu}{(\cos 30^\circ - \mu \sin 30^\circ)} = \frac{(0.25)}{[\cos 30^\circ - (0.25) \cdot \sin 30^\circ]} \cdot g$$

$$a = 0.3374 g \nearrow 30^\circ$$

PROB. 16-11 CONT.

CAN WILL TIP CCLW ↺:



$$\sum \vec{M}_A = \sum (\vec{M}_A)_{\text{EFF}} \quad \uparrow \circlearrowleft :$$

$$-\left(\frac{d}{2}\right)W = \left(\frac{d}{2}\right)ma \cdot \sin 30^\circ$$

$$-\left(\frac{h}{2}\right)ma \cdot \cos 30^\circ$$

$$-W = ma \cdot \sin 30^\circ - \left(\frac{h}{d}\right) \cdot ma \cdot \cos 30^\circ$$

$$\left(\frac{h}{d}\right) = \frac{ma \cdot \sin 30^\circ + W}{ma \cdot \cos 30^\circ}$$

$$\left(\frac{h}{d}\right) = \frac{\left(\frac{W}{g}\right)a \cdot \sin 30^\circ + W}{\left(\frac{W}{g}\right)a \cdot \cos 30^\circ} = \frac{\sin 30^\circ + \left(\frac{g}{a}\right)}{\cos 30^\circ}$$

$$\left(\frac{h}{d}\right) = \frac{\sin 30^\circ + \left(\frac{g}{0.33749}\right)}{\cos 30^\circ} = \frac{\sin 30^\circ + \left(\frac{1}{0.3374}\right)}{\cos 30^\circ}$$

$$\boxed{\left(\frac{h}{d}\right) = 4.0}$$