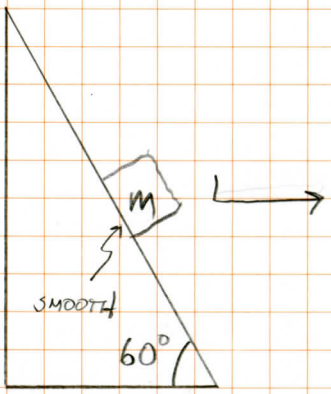
T3 Pr 4.45

T3 4.45 THE BLOCK REMAINS STATIONARY ON THE WEDGE
a) FIND a
b) WHAT WOULD HAPPEN IS a WERE GREATER?



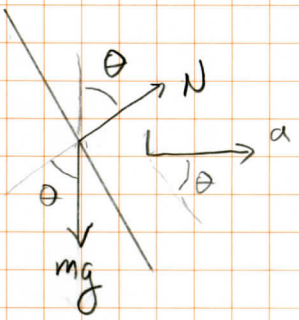
a) APPLY NSL

$\Sigma F_{VERT} = m\cancel{a}^{0}_{VERT}$ $\qquad$ $\Sigma F_{HORIZ} = ma_{HORIZ}$

$N\cos\theta - mg = 0$ $\qquad$ $N\sin\theta = ma$

$N = \frac{mg}{\cos\theta}$ $\longrightarrow$ $\left(\frac{mg}{\cos\theta}\right)\sin\theta = ma$

$$a = g\tan\theta = (9.8)\tan 60^\circ = 16.97\ m/s^2$$



OR

$\Sigma F_{\perp} = ma_{\perp}$ $\qquad$ $\Sigma F_{\parallel} = ma_{\parallel}$

$N - mg\cos\theta = a\sin\theta$ $\qquad$ $mg\sin\theta = \cancel{m}a\cos\theta$

$N = a\sin\theta + mg\cos\theta$ $\qquad$ $a = g\tan\theta$

EASIER!

b) IF $a > g\tan\theta$ THE BLOCK WILL SLIDE UP THE WEDGE