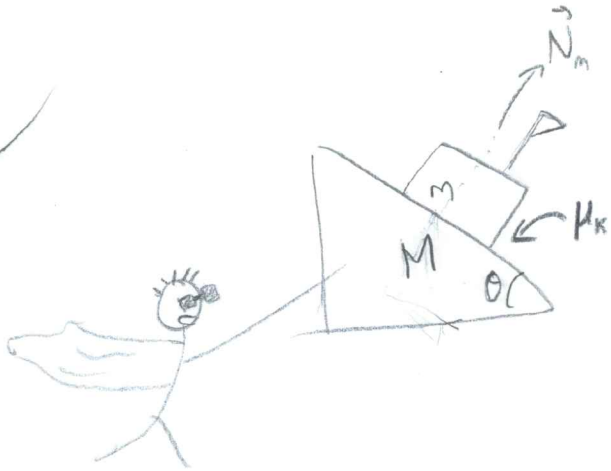
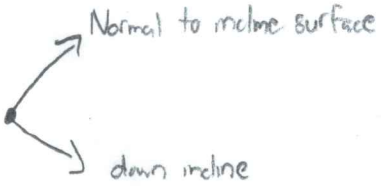
EX

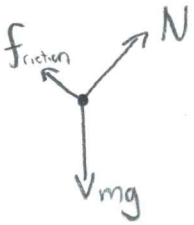


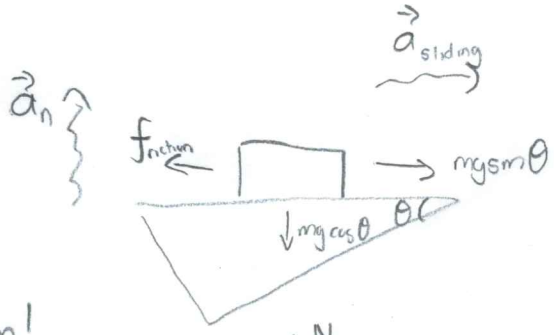
Superman accelerates the system in the $\vec{N}_m$ direction ($\vec{a}_n$). Find the magnitude of acceleration of mass m.

axis



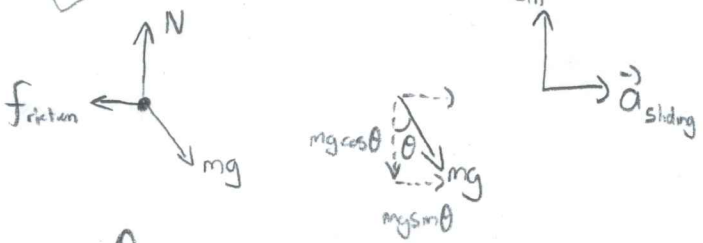
(m)





Let's rotate this diagram.

This looks like an elevator question!



So $ma_n = N - mg\cos\theta$

$N = ma_n + mg\cos\theta = m(a_n + g\cos\theta)$

(friction)

$ma_{sliding} = mgsm\theta - \mu_K N$

$a_{sliding} = \dfrac{mgsm\theta - \mu_K m(a_n + g\cos\theta)}{m} = gsm\theta - \mu_K(a_n + g\cos\theta$

$a_{resultant} = \sqrt{a_n^2 + a_{sliding}^2}$