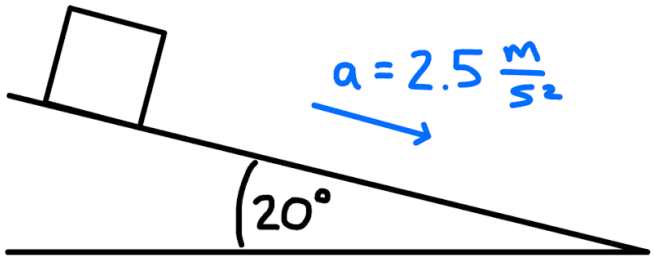
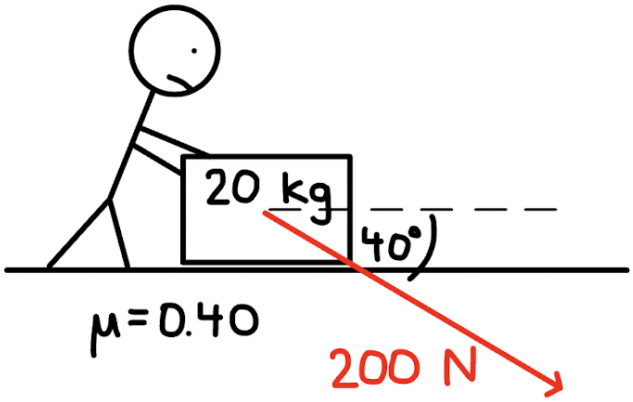
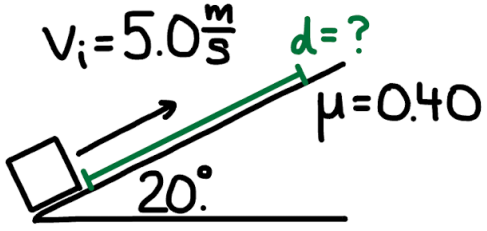
Determine the coefficient of friction.



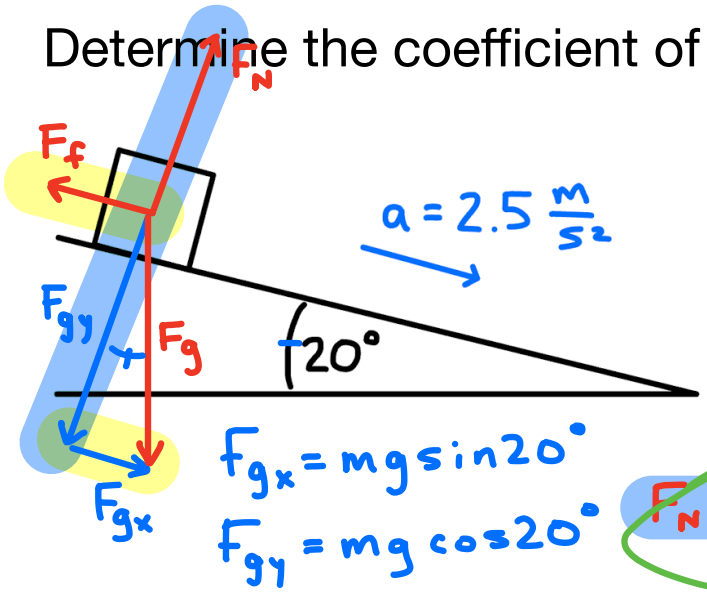
Determine the acceleration of the object.



A mass is given an initial velocity of 5.0 m/s at the base of a ramp. How high up the ramp does the mass reach?



Determine the coefficient of friction.



$F_{gx} = mg\sin 20°$

$F_{gy} = mg\cos 20°$

$F_N = F_{gy}$

$= mg\cos 20°$

$F_{NET} = ma$

$F_{gx} - F_f = ma$

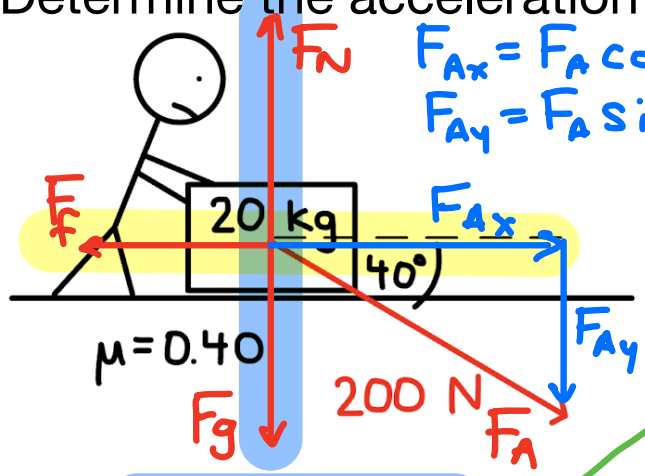
$mg\sin 20° - \mu F_N = ma$

$mg\sin 20° - \mu mg\cos 20° = ma$

$\mu = \frac{g\sin 20° - a}{g\cos 20°}$

$= \boxed{0.0925}$

Determine the acceleration of the object.



$F_{Ax} = F_A\cos 40°$

$F_{Ay} = F_A\sin 40°$

$F_N = F_g + F_{Ay}$

$= mg + F_A\sin 40°$

$F_{NET} = ma$

$F_{Ax} - F_f = ma$

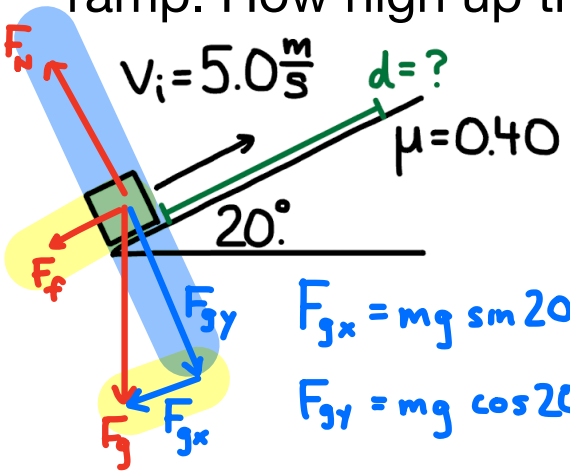
$F_A\cos 40° - \mu F_N = ma$

$F_A\cos 40° - \mu(mg + F_A\sin 40°) = ma$

$a = \frac{F_A\cos 40° - \mu(mg + F_A\sin 40°)}{m}$

$= \boxed{1.17 \frac{m}{s^2} \text{ RIGHT}}$

A mass is given an initial velocity of 5.0 m/s at the base of a ramp. How high up the ramp does the mass reach?



$F_{gx} = mg\sin 20°$

$F_{gy} = mg\cos 20°$

$F_N = F_{gy}$

$F_N = mg\cos 20°$

$F_{NET} = ma$

$-F_{gx} - F_f = ma$

$-mg\sin 20° - \mu F_N = ma$

$-mg\sin 20° - \mu mg\cos 20° = ma$

$a = -g(\sin 20° + \mu\cos 20°)$

$= -7.04 \frac{m}{s^2}$

$v_f^2 = v_i^2 + 2ad$ ($v_f = 0$)

$d = \frac{-v_i^2}{2a} = \boxed{1.78 \text{ m}}$