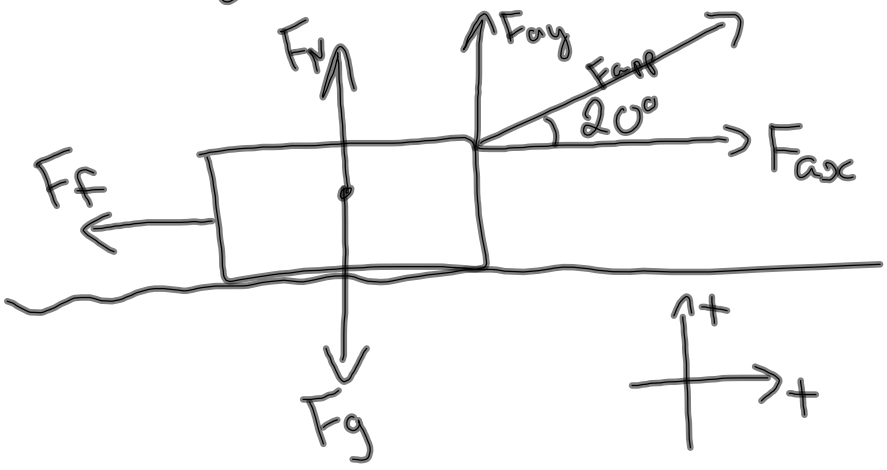
#2) $x_{comp} \rightarrow \cos\theta$

$y_{comp} \rightarrow \sin\theta$



$F_{netx} = 0$

$F_{netx} = F_f + F_{ax} + \cancel{F_{gx}}^{0}$

$0 = F_f + 7\cos 20°$

$F_f = -6.6\ N$

b) $F_{nety} = 0$

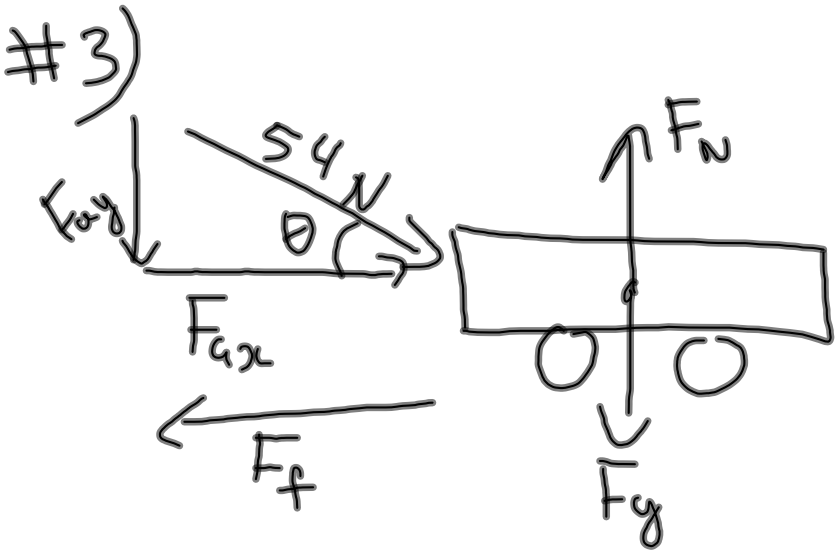
$F_{nety} = F_g + F_{ay} + F_N$

$0 = -(2.5)(9.81) + 7\sin 20 + F_N$

$F_N = 22\ N$

$F_f = \mu F_N$

#3)

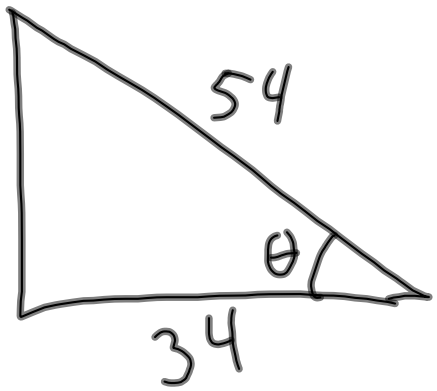


$$F_{netx} = 0$$

$$= F_{ax} + F_f$$

$$0 = F_{ax} - 34\,N$$

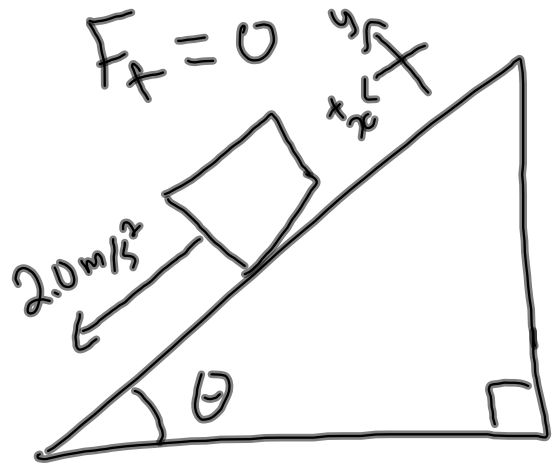
$$F_{ax} = 34\,N$$



$$\cos\theta = \frac{34}{54}$$

$$\theta = 51^\circ$$

6)

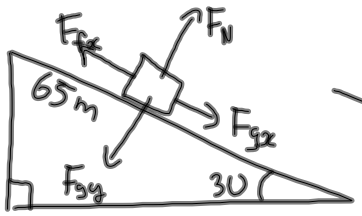


$$a_{gx} = a_g \sin\theta$$

$$2.0 = 9.81 \sin\theta$$

$$\theta = 12^\circ$$

#7)



$\mu = 0.45$

Find $F_{netx} = ?$

$v_f = ?$

$v_0 = 0\ m/s$

$a_{netx} = ?$

$F_{netx} = F_{gx} + F_{fx}$

$F_{gx} = F_g \sin\theta$ ($7.2 \times 9.81 = 70.6$)

$= 70.6 \sin 30°$

$= 35.3\ N$

$F_f = ?$ $F_f = \mu F_N$

$F_{nety} = F_N + F_{gy}$

$0 = F_N + (-70.6 \cos 30)$

$F_N = 61.14\ N$

$F_f = 0.45(61.14)$

$F_f = 27.5\ N$

$F_{netx} = F_{gx} + F_{fx}$

$= 35.3 + (-27.5)$

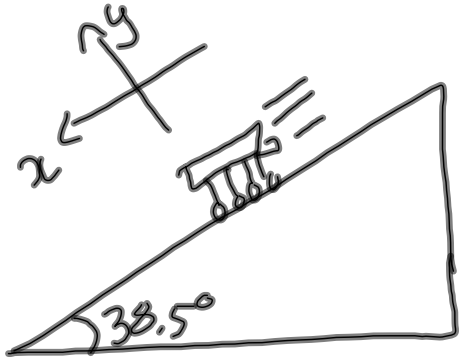
$F_{netx} = 7.787\ N$

$a_{netx} = \frac{F_{netx}}{m} = \frac{7.787}{7.2} = 1.08\ m/s^2$

$v_f^2 = v_0^2 + 2ad$

$v_f = \sqrt{0 + 2(1.08)(65)} = 12\ m/s$

#8)



$a_{net\,x} = 4.62\ m/s^2$

$$\mu = \frac{F_f}{F_N} = \frac{ma_f}{ma_N} = \frac{a_f}{a_N}$$

$$a_{net\,x} = a_{gx} + a_f$$

$$4.62 = 9.81 \sin 38.5^\circ + a_f$$

$$4.62 - 9.81 \sin 38.5 = a_f$$

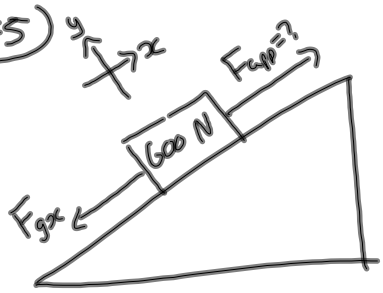
$$-1.48\ m/s^2 = a_f$$

$$|a_N| = |a_{gy}| = |9.81 \cos 38.5^\circ|$$

$$= 7.67\ m/s^2$$

$$\mu = \frac{|a_f|}{|a_N|} = \frac{1.48}{7.67} = \boxed{0.19}$$

#5)



$F_{netx} = 0$ (constant speed)

$= F_{gx} + F_f + F_{app}$

$F_f \rightarrow 0$ frictionless

$0 = -(600N)\sin 42° + F_{app}$

$0 = -401N + F_{app}$

$\boxed{F_{app} = 401\,N}$

b) If $F_{app} = 550$ N what is acceleration of object?

$F_{netx} = F_{gx} + F_{app}$

$= -401 + 550$

$F_{netx} = 149N$

$F_{netx} = (m)(a_{netx})$

$149 = m(a_{netx})$

$\frac{149}{61} = a_{netx}$

$\boxed{2.4\,m/s^2 = a_{netx}}$

$m = \frac{F_g}{9.81}$

$m = \frac{600N}{9.81} = 61\,kg$