HW #3

Ch.5 #7

+2

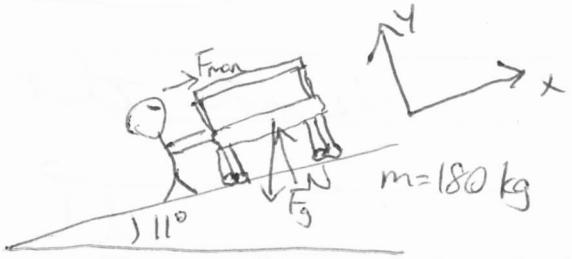
$F_{gx} = F_g \sin 17.5°$ (+2)

$= mg \sin 17.5°$

$= 1390(-9.8)\sin 17.5°$

$= 4,096\ N$ (+1)

Ch.5 #11



+1

a) constant $v \Rightarrow F_{tot} = 0$

$F_{man} = -F_{gx}$ (+2)

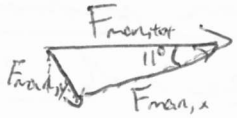
$F_{man} = -mg\sin 11°$

$= -180(9.8)\sin 11°$

$= 336.6\ N$

b) $F_{man,x} = 336.6\ N$

$F_{man,tot} = ?$

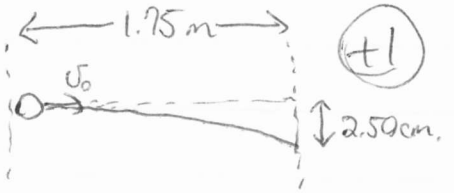


+2

$\cos 11° = \frac{F_{man,x}}{F_{man,tot}}$

$F_{man} = \frac{F_{man,x}}{\cos 11} = \frac{336.6}{\cos 11} = 342.9\ N$

Ch.5 #25



+1

time to travel across table = $t = \frac{1.75\ m}{v_0}$

$t = \frac{1.75}{3.8} = 0.46\ s.$

$d = \frac{1}{2}at^2$

$2.50\ cm \cdot \frac{1\ m}{100\ cm} = \frac{1}{2}a(0.46)^2$

$2.5\times10^{-2}\ m = 0.106a$

$a = 0.24\ m/s^2$ (+2)

Force from gravity on an incline

$F_{gx} = F_g \sin\theta$

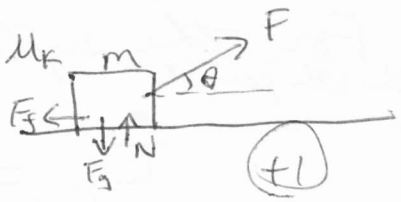
$a_{gx} = a_g \sin\theta$

$0.24 = 9.8\sin\theta$ (+2)

$\sin\theta = \frac{0.24}{9.8}$

$\boxed{\theta = 1.4°}$

Ch.5 #44



We know $F_x = -F_f$

a) $F\cos\theta = -\mu_k(mg + F\sin\theta)$

$F\cos\theta + \mu_k F\sin\theta = -\mu_k mg$

$F(\cos\theta + \mu_k\sin\theta) = -\mu_k mg$

$F = -\dfrac{\mu_k mg}{\cos\theta + \mu_k\sin\theta}$ (+3)

b) $\mu_k = 0.35$, $\theta = 25$, $m = 90\,kg$

$F = -\dfrac{0.35(90)(9.8)}{\cos 25 + 0.35\sin 25} = 292.8$ (+1)

Ch.5 #99

a) moves up (+1)

b) remains constant (+1)

c) remains constant (+1)

d) stops moving (+1)

(+1) for getting any part of a-d correct.