1)

$V =$ constant is code for

$a = 0 \quad \therefore \quad F_{NET} = 0$

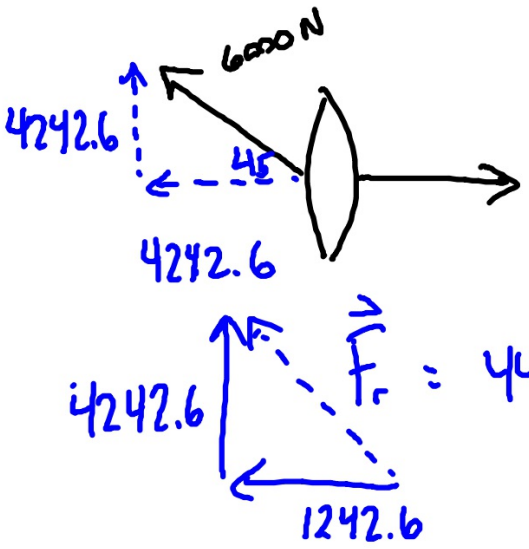
2)

inertial frame of reference

not accelerating

5) bird's eye view

$m = 2000$



$\vec{F}_r = 4420.9\ N$

$a = \frac{F_{NET}}{m}$

7)

$$a = \frac{\Delta V}{t} = \frac{9-0}{.15} =$$

$$F = ma$$

8. $m = 70\ kg$

$\Delta x_1 = 1m$

$t = 0.02$

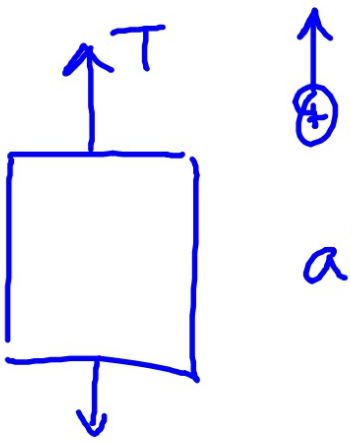
$V_F^2 = \cancel{V_0^2} + 2a\Delta x$

$V_F = \sqrt{20}$

$a = \frac{\Delta V}{t} = \frac{\sqrt{20}}{.02}$

$F = ma = 70\left(\frac{\sqrt{20}}{.02}\right)$

16)



$a \uparrow 3 \frac{m}{s^2}$

$\sum F_y = ma_y$

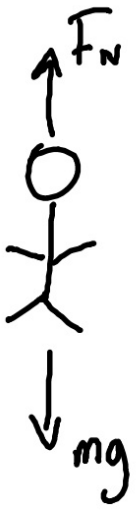
$T - mg = ma$

$T = ma + mg$

$= 2000(3) + 20000$

$= 26000\ N$

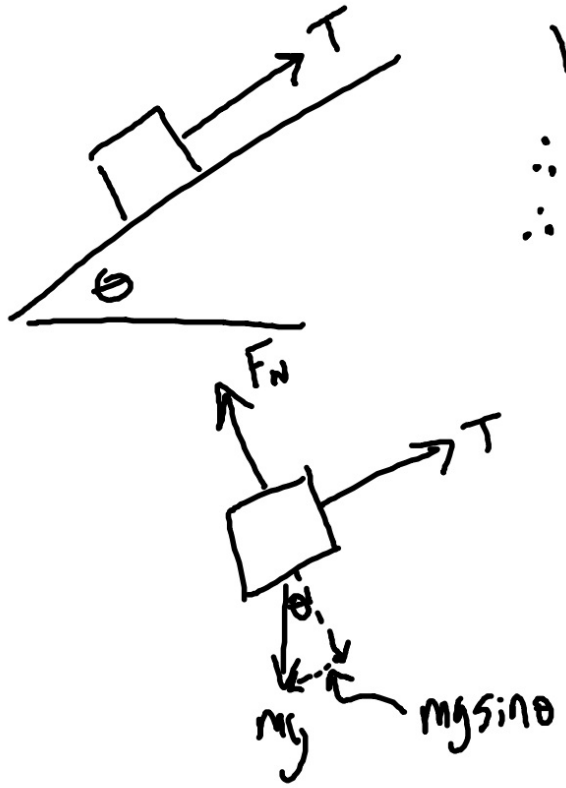
17)



remember:

3rd law action/reaction pair never appear in same FBD!

18)



V = constant

$\therefore a = 0$

$\therefore F_{net} = 0$

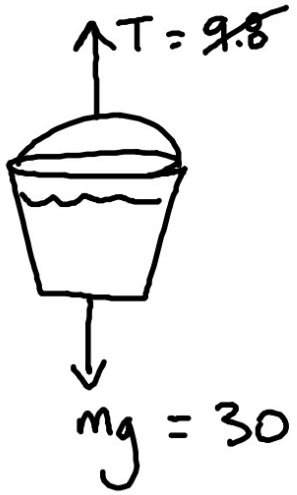
$\Sigma F_x = ma_x$ (0)

$T - mg\sin\theta = 0$

$T = mg\sin\theta$

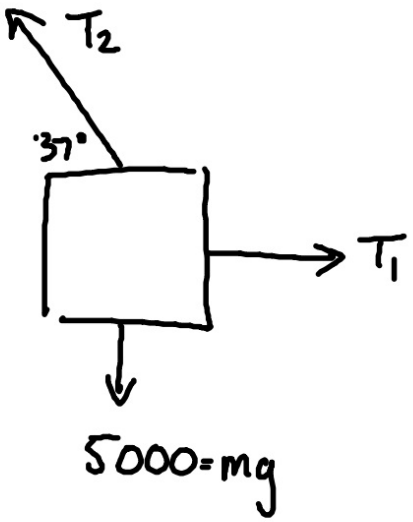
fraction

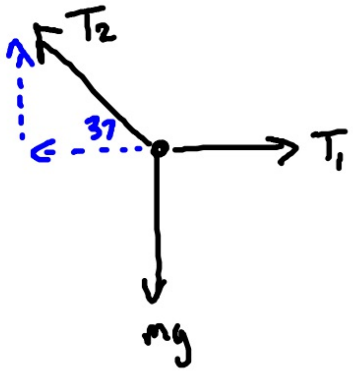
19)



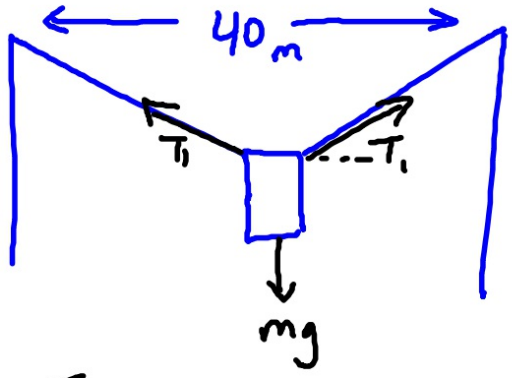
$$a = \frac{F_{NET}}{m} = \frac{20}{3} = 6.67 \frac{m}{s^2}$$

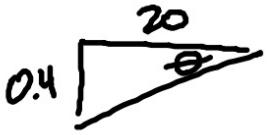
20)





25)

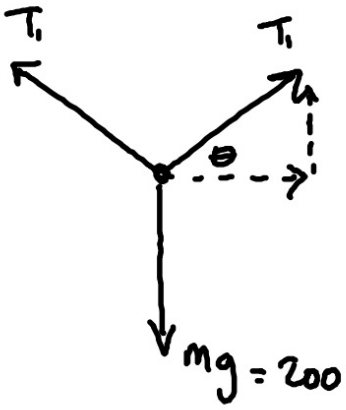




$$\tan\theta = \frac{.04}{20}$$

$$\theta = \tan^{-1}\left(\frac{0.4}{20}\right)$$

$$\theta = 1.15^\circ$$

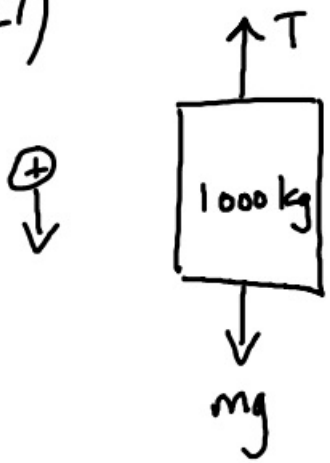


$$\Sigma F_y = ma_y^{\nearrow 0}$$

$$2T\sin\theta - mg = 0$$

$$T = \frac{mg}{2\sin\theta}$$

27)



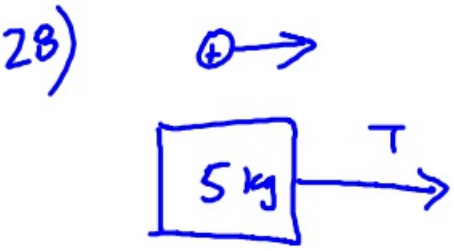
$$\Sigma F_y = ma$$

$$mg - T = ma$$

$$mg - ma = T$$

$$1000(10 - 1.8) = T$$

28)

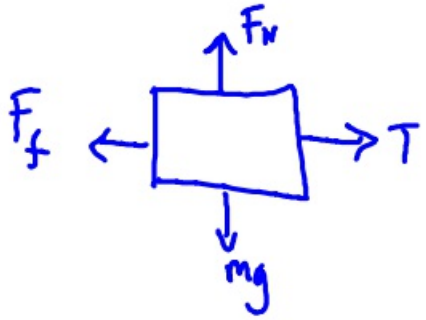


$a = 2 \frac{m}{s^2}$

$\sum F_x = ma_x$

$\mu = 0.2$

$T - F_f = ma$



$F_f = \mu F_N$

$(.2)(50)$

$= 10$

$T = ma + F_f$

$T = 5(2) + 10$

$T = 20\,N$

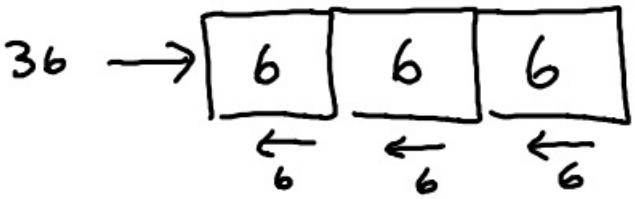
30)

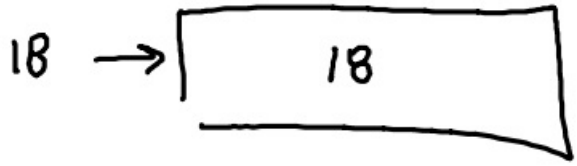
frictionless

$a = 2 \frac{m}{s^2}$

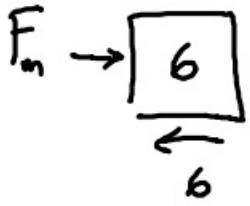
$6 @ 2 \frac{m}{s^2} = 12 N$

Same w/ friction





$a = 1$



$F_m = 12 N$