Soh
Cah

1)

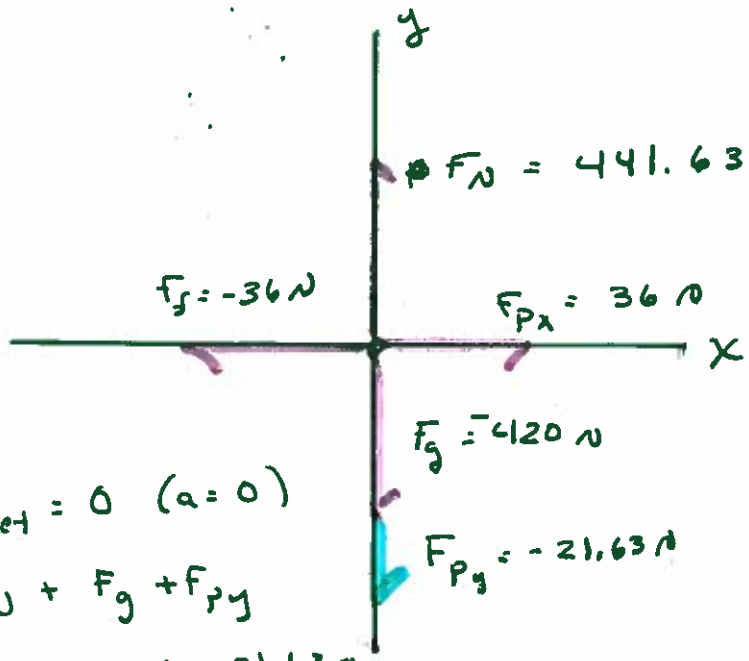
$F_g = 420N$

$F_p = 42N$

$\theta = 31°$

$a = 0$

$F_f = ?$



y:

$F_{net} = 0 \quad (a = 0)$

$0 = F_N + F_g + F_{Py}$

$0 = F_N - 420N - 21.63N$

$F_{Py} = F_p \sin\theta$

$F_{Px} = F_p \cos\theta$

x

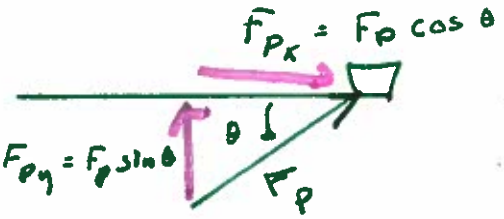
$F_{net} = 0 \quad (a = 0)$

$0 = F_f + F_{Px}$

$0 = F_f + 36$

Soh
Cah

2)



both are positive

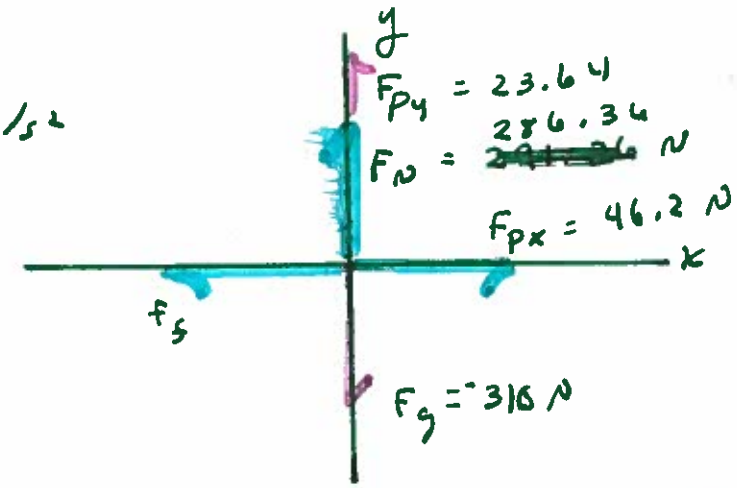
$F_g = 310\ N$

$F_p = 51.9\ N$

$\theta = 27.1°$

$a_x = 1.31\ m/s^2$

$\mu = ?$



$F_{net} = ma$

$m = F_g/g = 310/9.8 = 31.63\ kg$

$F_{net} = 31.63\ (1.31)$

$F_{net} = 41.44\ N$

$F_{net} = F_f + F_{px}$

$41.44 = F_f + 46.2\ N$

$F_f = -4.76$

$F_f = \mu F_N$

$\mu = \dfrac{4.76}{286.36}$

$= .0166$

$F_{net} = 0 \quad a = 0$

$F_{net} = F_{py} + F_N + F_g$

$0 = 23.64 + F_N - 310$

$F_N = 286.36$

3)

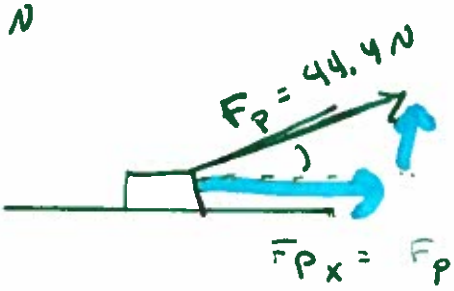
$F_p = 44.4\ N$

$\theta = 36.7$

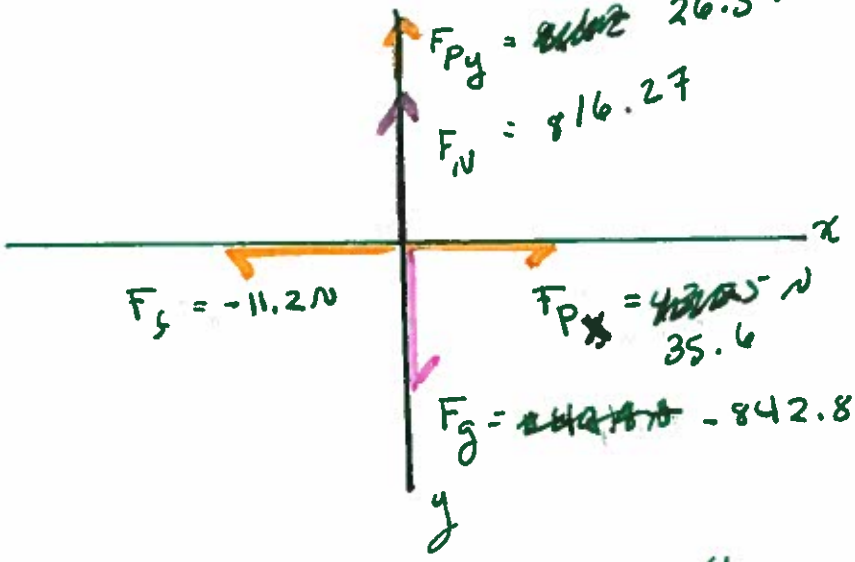
$F_f = 11.2\ N$

$a_x = ?$

$m = 86$



both are positive



y

$F_{net} = F_f + F_{px}$

$F_{net} = -11.2 + 35.6$

$F_{net} = 32.35\ N$

$F_{net} = ma$

$24.4 = 86\,(a)$

$a = 0.28\ m/s^2$

$F_{net} = 0 \quad a = 0$

$F_{net} = F_g + F_N + F_{py}$

$0 = -842.8 + F_N + 26.53$

$F_N = 816.27$

4)

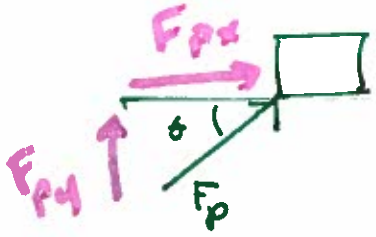
$F_g = 351\ N$

$F_p = 57.5\ N$

$\theta = 25.8°$

$a = 2.2\ m/s^2$

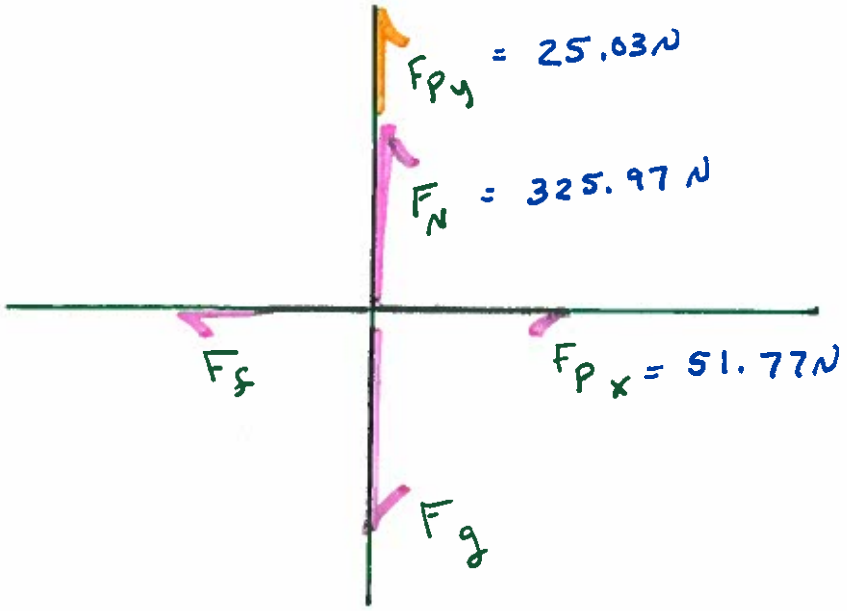
$F_N = ?$



$F_{py} = F_p \sin\theta$

$F_{px} = F_p \cos\theta$

both are +



$F_{net} = F_g + F_N + F_{py}$

$F_N = F_g - F_p \sin\theta$

5)

both positive

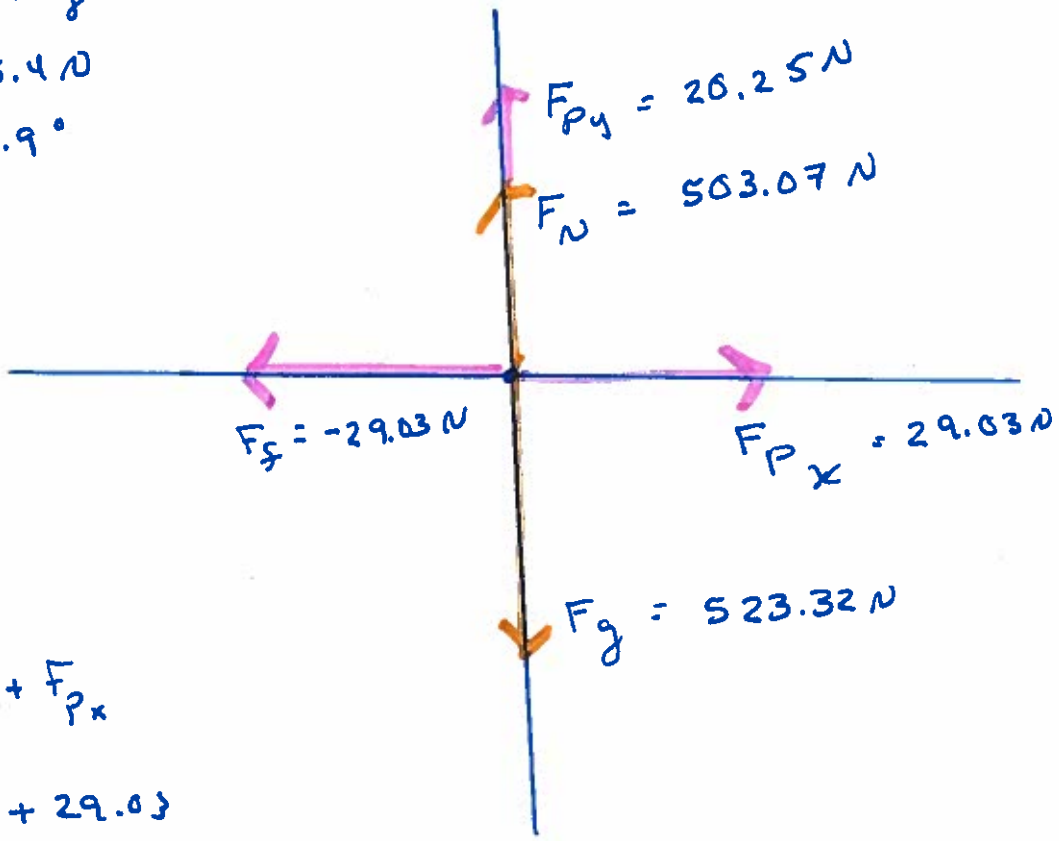
$m = 53.4\,kg$

$F_P = 35.4\,N$

$\theta = 31.9°$

$a = 0$

$\mu = ?$



$a = 0$

$\therefore F_{net} = 0$

$F_{net} = F_f + F_{Px}$

$0 = F_f + 29.03$

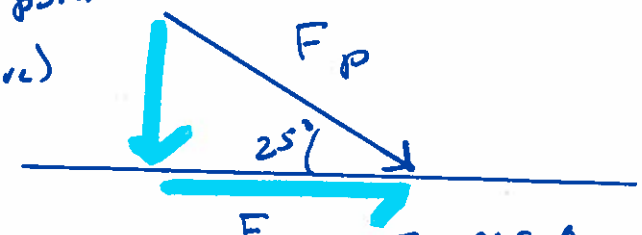
$F_f = \mu F_N$

$\frac{29.03}{503.07} = \mu$

$\mu = 0.0577$

6)

$F_{Py} = F_P \sin\theta$ (negative)



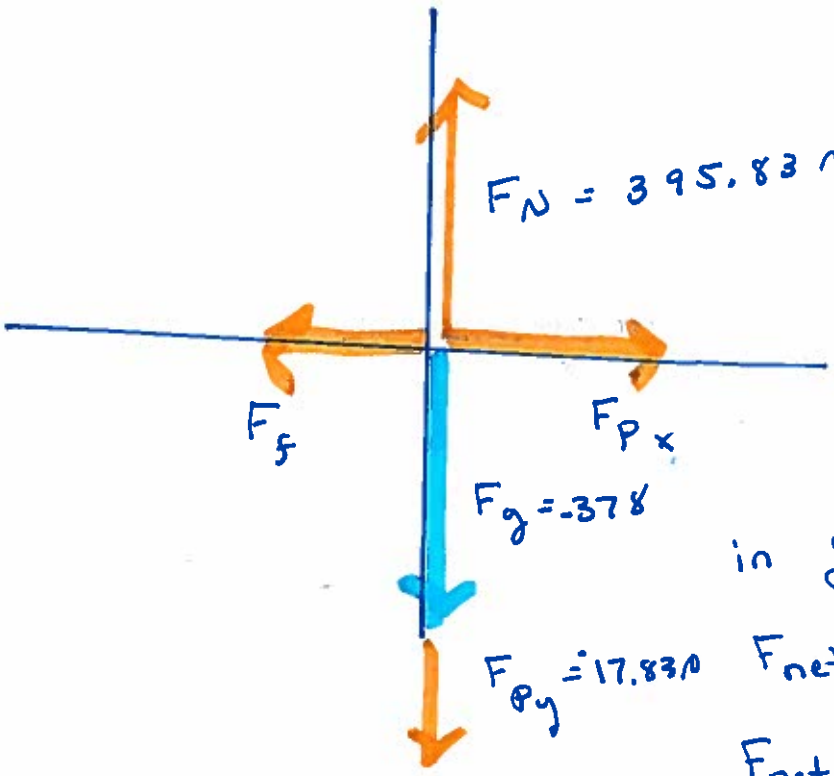
$F_g = 378\,N$

$F_P = 42.2\,N$

$\theta = 25°$

$a = 0$

$F_N = ?$



in y-direction

$F_{net} = 0$

$F_{net} = F_N + F_g + F_{Py}$

$0 = F_N - 378\,N - 17.83$

7)

SOH
CAH

$F_g = 418.6\ N$

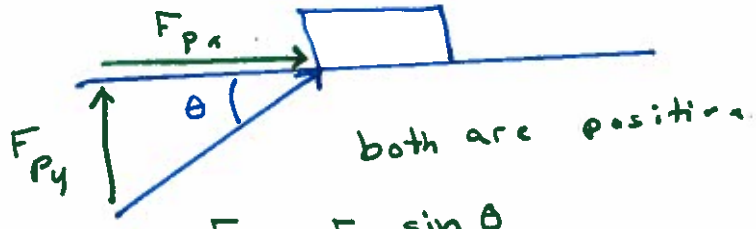
$F_p = 33.3\ N$

$\theta = 26°$

$\mu_s = .31$

$\mu_k = .18$

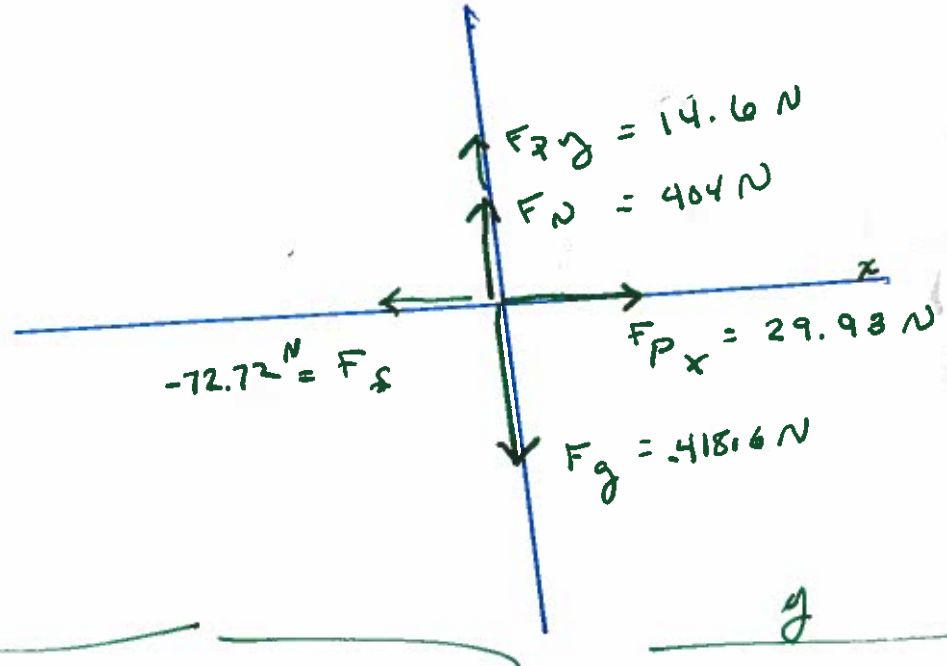
$a = ?$



both are positive

$F_{py} = F_p \sin\theta$

$F_{px} = F_p \cos\theta$



x

$F_f = \mu F_N$

since it's moving, use μ_k

$F_f = (.18)(404) = 72.72\ N$

$F_{net_x} = F_f + F_{px}$

$= -72.72 + 29.98$

$F_{net_x} = -42.74\ N$

y

$F_{net} = 0$, $a = 0$

$F_{net} = F_g + F_N + F_{py}$

$0 = -418.6 + F_N + 14.6$

$F_N = 404\ N$

$F_{net} = ma$

$a = \dfrac{-42.74}{42.71} = -1.00\ m/s^2$