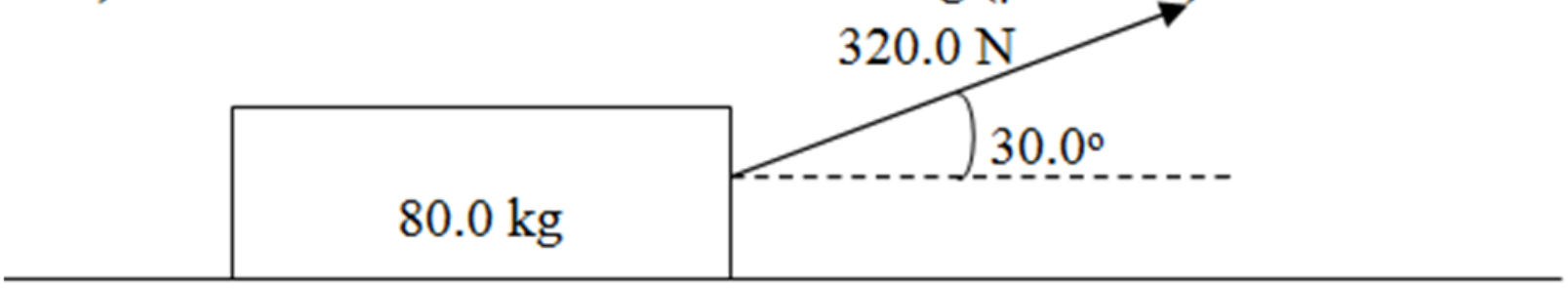
11) Find the acceleration of the following ($\mu = 0.30$):

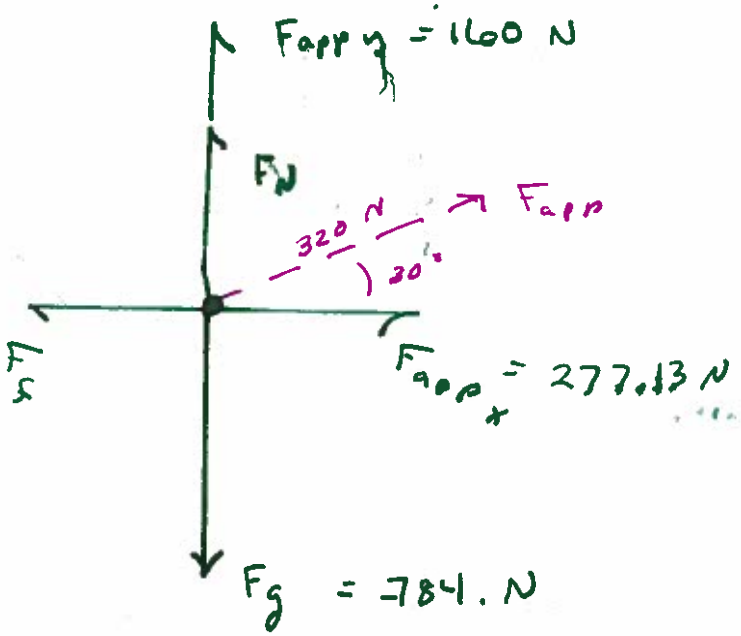


Sol
Ca

$a = ?$

$\mu = .3$

$m = 80\ kg$



$F_{app\,y} = F_{app} \sin\theta$

$= 320 \sin 30°$

$= 160\ N$

$F_{app\,x} = F_{app} \cos\theta$

$= 320 \cos 30$

$= 277.13\ N$

x

$F_f = \mu F_N$

$F_f = (.3)(624)$

$F_f = 187.2\ N$

$F_{net} = F_f + F_{app\,x}$

$F_{net} = -187.2 + 277.13$

$F_{net} = 89.93\ N$

$F_{net} = ma$

$89.93 = (80)a$

$a = 1.12\ m/s^2$

y

$a = 0$

$\therefore F_{net} = 0$

$F_{net} = F_g + F_N + F_{app\,y}$

$0 = -784. + F_N + 160$

$F_N = 624\ N$

John sits the Christmas present he just wrapped (a glass vase) on a board. The present, fortunately, is just on the verge of sliding, but does not move. The board is at an angle of 42^{o}, and the present has a mass of 2 kg. What is the normal force and frictional force of the present?

soh
cah

Problem Number	Work

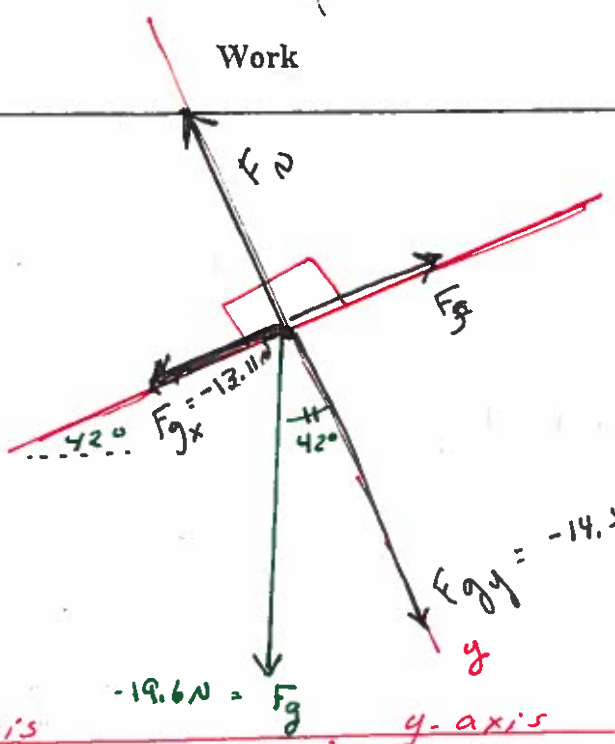
$m = 2\,kg$

$\theta = 42°$

$a = 0$

$F_N = ?$

$F_f = ?$



$F_{gx} = -19.6 \sin 42$

$= -13.11\,N$

$F_{gy} = -19.6 \cos 42$

$F_{gy} = 14.57\,N$

x-axis

$a = 0$

$\therefore F_{net} = 0$

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

$0 = -13.11 + F_f$

$F_f = 13.11\,N$

y-axis

$a = 0$

$\therefore F_{net} = 0$

$\therefore$

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

$0 = -14.57 + F_N$

$F_N = 14.57\,N$