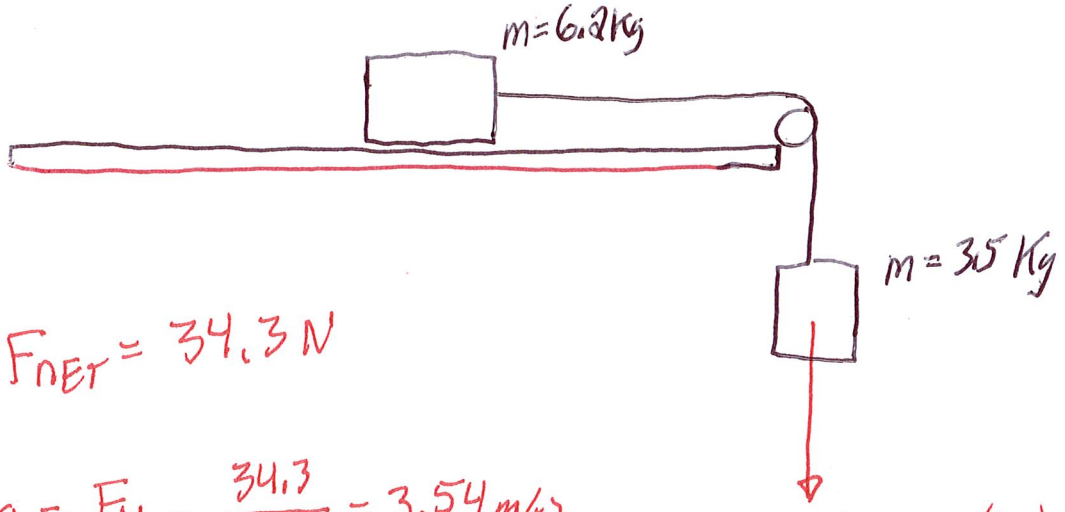
Physics 11 Unit 2 Worksheet 4 Two Mass Problems

Name: _____ — KEY —

1. Find the acceleration and the tension in the example below (Flat, no friction)



$F_{NET} = 34.3\ N$

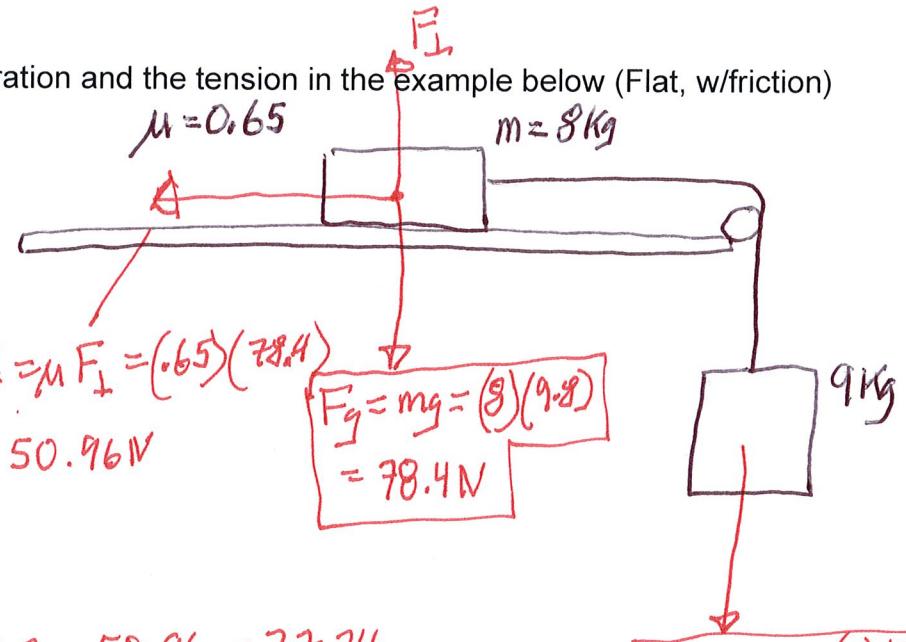
$a = \frac{F_N}{m} = \frac{34.3}{9.7} = 3.54\ m/s^2$

$F_g = mg = (3.5)(9.8) = 34.3N$

To find tension look @ one mass

$T = F_{NET} = ma = (6.2)(3.54) = 21.9\ N$

2. Find the acceleration and the tension in the example below (Flat, w/friction)

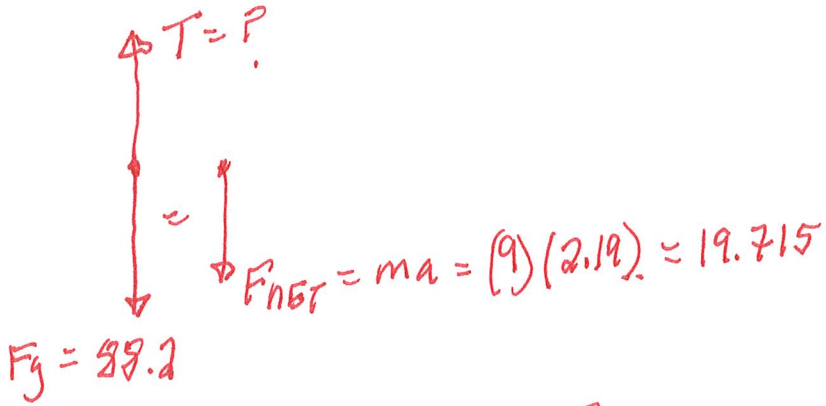


$F_{NET} = 88.2 - 50.96 = 37.24$

$F_g = mg = (9)(9.8) = 88.2\,N$

$a = \frac{F_N}{m} = \frac{37.24}{17} = 2.19\,m/s^2$

Tension - Look @ one mass



$F_N = F_g - T$

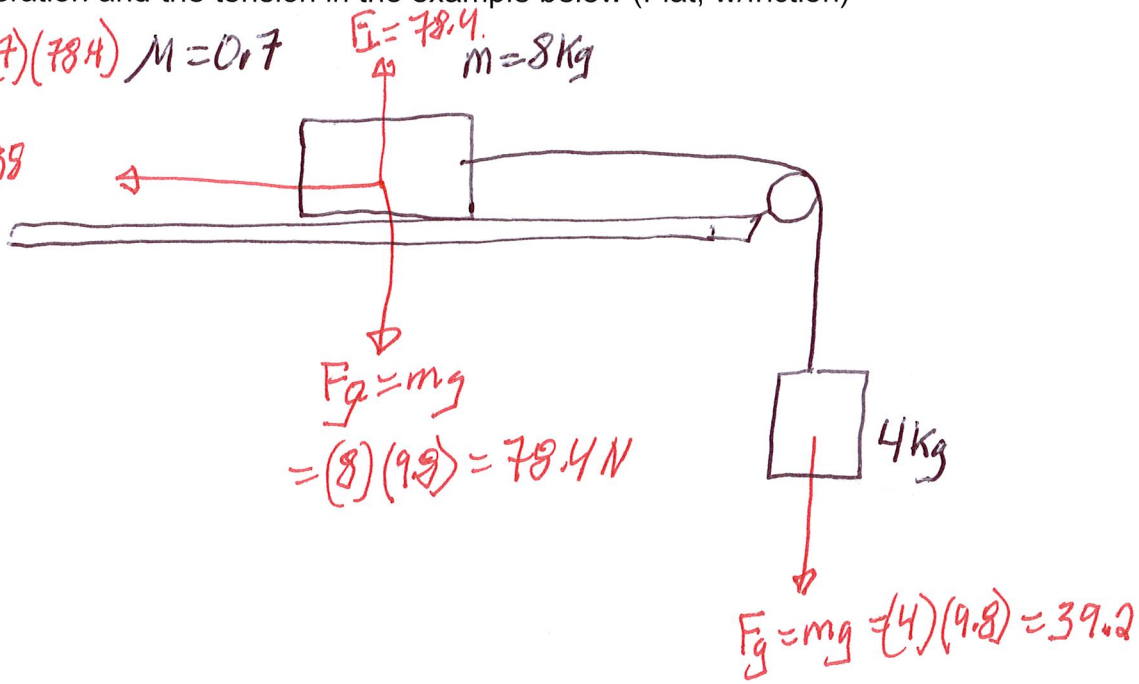
$19.715 = 88.2 - T$

$T = 88.2 - 19.715 =$ 64.5 N

3. Find the acceleration and the tension in the example below (Flat, w/friction)

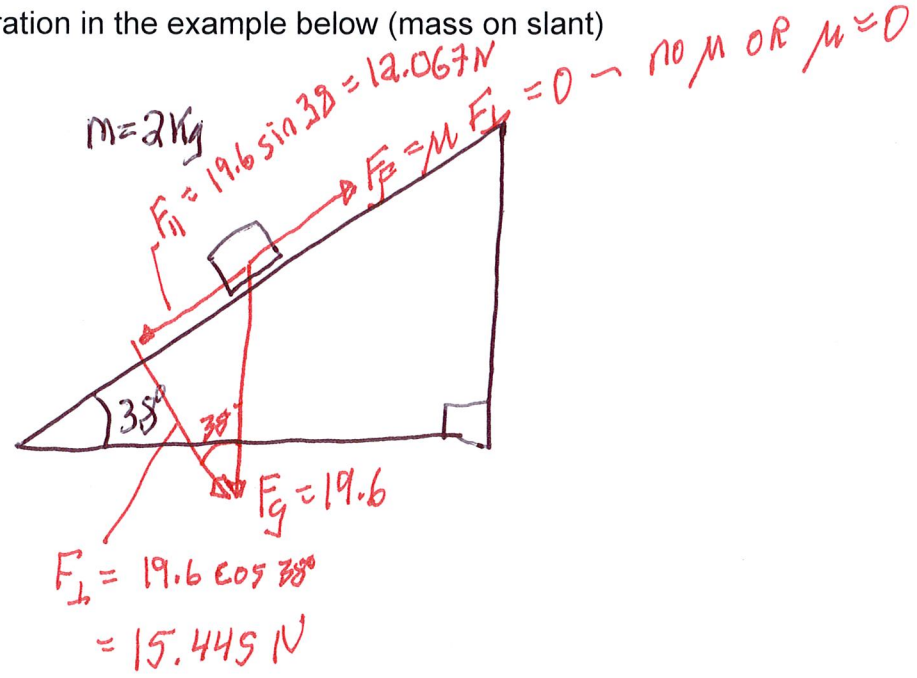
$F_f = \mu F_\perp = (.7)(78.4)$ $\mu = 0.7$

$F_f = 54.88$



In this case there is enough potential friction force to counter act the F_g from the hanging mass, so Accel = 0.

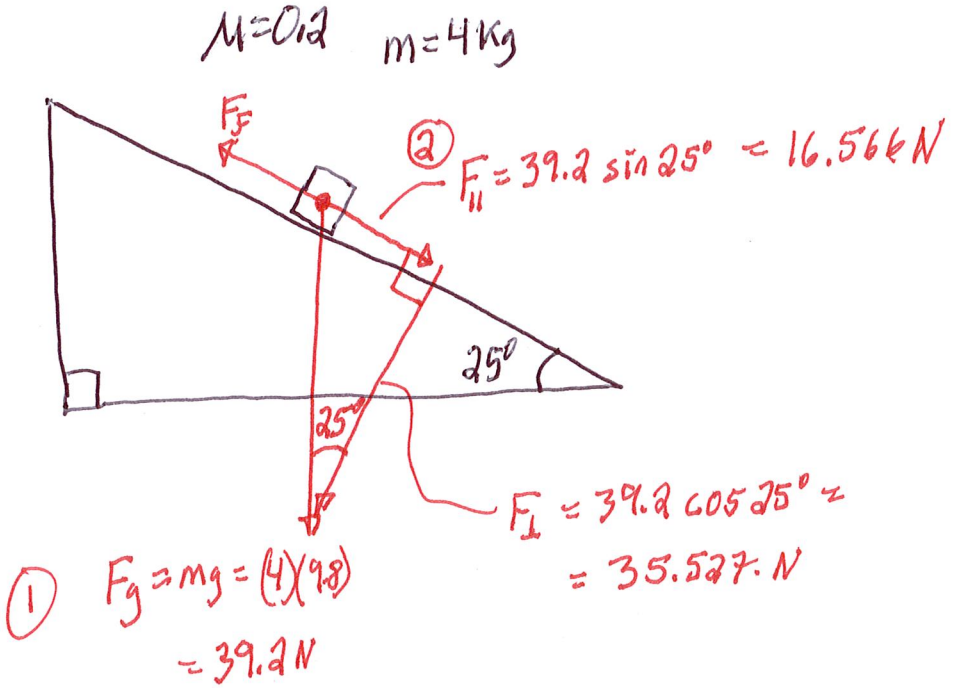
4. Find the acceleration in the example below (mass on slant)



$F_{NET} = F_f = 12.067$

$a = \frac{F_N}{m} = \frac{12.067}{2} = 6.03\ m/s^2$

5. Find the acceleration in the example below (mass on slant)



③ $F_f = \mu F_\perp = (0.2)(35.527) = 7.105\ N$

④ $F_{NET} = 16.566 - 7.105 = 9.460\ N$

⑤ $a = \frac{F_N}{m} = \frac{9.460}{4} = 2.37 m/s^2$