1. (10 pts) I set the system of masses at right from rest. The suing and pulley are massless and frictionless, but there is a coefficient of friction between the 2 kg object and the surface of 0.2.

a) After reading the questions, please state which of the 4 concepts are central to your solving this problem and why.

This is a dynamics problem because we are dealing with forces and looking for acceleration.

b) What is the acceleration of the system?

$\Sigma F = ma$ $F_F = \mu F_N = (0.2)(20N) = 4N$ $\frac{20}{5} = 4$
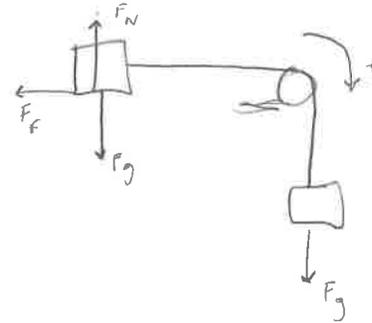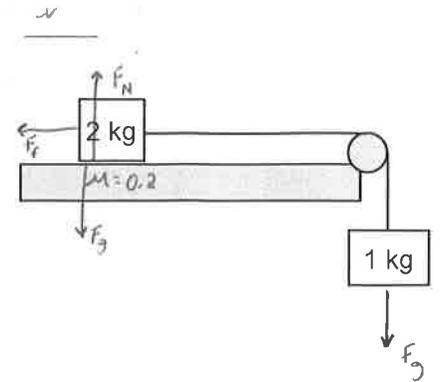
$F = ma = (1kg)(10 m/s^2) = 10 N$

$\Sigma F = (10N) + (-4N) = 6N$

$F = ma$

$6N = 3kg \cdot a$

$a = 2 m/s^2$

a = ___2 m/s²___

c) What is the tension of the string?

$\Sigma F = ma$

$(2kg)(2 m/s^2) = 4 N$

$\Sigma F = ma = F_T - F_f$

$F_T = ma + F_f$

$(4N) + (4N) = 8N$