Worksheet 3.3 Inclines (part 2)

1) Two blocks are tied together with a string as shown.

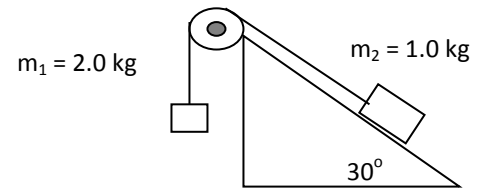If both the pulley and incline are frictionless find

m_1 = 2.0 kg m_2 = 1.0 kg

30°

   a) the direction and magnitude of acceleration on
       the 1.0 kg mass.
$$(4.9 m/s^2 \text{ up the ramp})$$

   b) the tension in the string joining the blocks.
$$(9.8 \text{ N})$$

2) If the ramp and block in question 1 have a coefficient of friction of 0.135, what will be the block's acceleration?
$$(4.5 \text{ m/s}^2)$$

3) Do questions 1 and 2 if m_2 = 6.0kg instead.
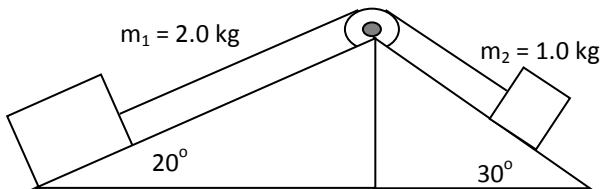
$(1.2 m/s^2$ down the ramp)   (22N)
$(0.37 m/s^2$ down the ramp)

4) Using the diagram below, calculate the acceleration of the masses and the tension in the rope.

$(0.60 m/s^2$ to the left)   (5.5N)

m_1 = 2.0 kg m_2 = 1.0 kg

20° 30°

5) Consider the diagram below. If the coefficient of friction between the ramps is 0.111, find the acceleration and the tension in the ropes.

$(3.6 m/s^2$ to the right)   (9.5N)

m_1 = 2.0 kg

m_2 = 3.0 kg

50°