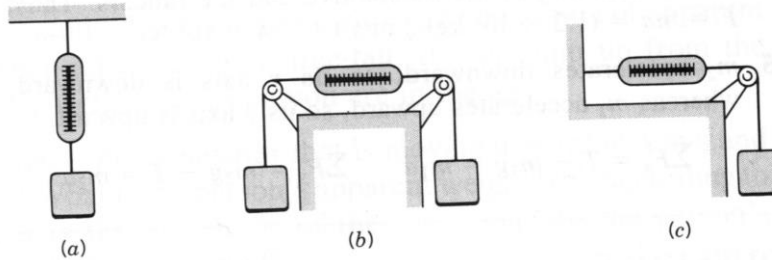
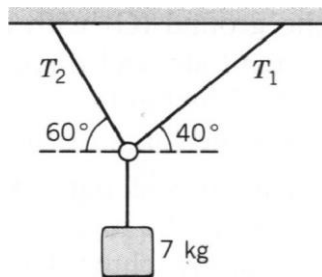


## Homework #6

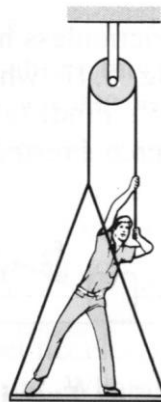
- 1) Two forces  $\vec{F}_1 = 1.00 \hat{i} + 2.00 \hat{j}$  N and  $\vec{F}_2$  which is 4.00 N directed at  $37^\circ$ , measured from the positive x-axis, act on a 200-g particle. What is its acceleration?
- 2) A Saturn V rocket has a mass of  $2.70 \times 10^6$  kg and a thrust of  $3.30 \times 10^7$  N. What is its initial vertical acceleration?
- 3) What is the reading on the spring scale for each of the situations depicted in the figure below? Each of the blocks has a mass of 5.00 kg.



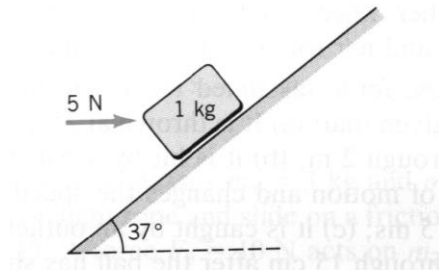
- 4) A 7.00-kg block is suspended with two ropes, as shown in the figure. Find the tension in each rope.



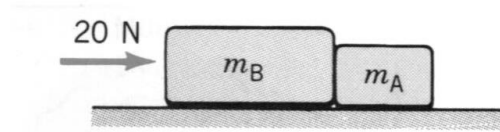
- 5) A painter of mass  $M = 75.0$  kg stands on a platform of mass  $m = 15.0$  kg. He pulls on a rope that passes around a pulley, as shown in the figure. Find the tension in the rope given that (a) he is at rest, or (b) he accelerates upward at  $0.400 \text{ m/s}^2$ . (c) If the maximum tension the rope can withstand is 700 N, what happens when he ties the rope to a hook on the wall?



6) The figure shows a block of mass  $1.00\text{ kg}$  is on a frictionless  $37.0^\circ$  incline that is subject to a horizontal force of  $5.00\text{ N}$ . (a) What is its acceleration? (b) If it is initially moving up the incline at  $4.00\text{ m/s}$ , what is its displacement along the incline in  $2.10\text{ s}$ ?



7) The two blocks shown in the figure below masses  $m_A = 1.95\text{ kg}$  and  $m_B = 3.10\text{ kg}$ . They are in contact and slide over a frictionless horizontal surface. A force of  $20.0\text{ N}$  acts on B as shown. Find: (a) the acceleration; (b) the force on B due to A; (c) the net force on B; (d) the force on B due to A if the blocks are interchanged.



8) Two blocks of masses  $m_1 = 4.85\text{ kg}$  and  $m_2 = 5.75\text{ kg}$  are on either side of the wedge as shown in the figure below. Find their acceleration and the tension in the rope. Ignore friction and the pulley.

