1. A block of mass 3.2 kg is pulled across a horizontal frictionless floor by a string that makes an angle of 30° with the horizontal. The tension in the string is 25 N. (a) At $t = 1.5$ s, the block is moving along the floor with a horizontal velocity of 4.5 m/s in the direction of the pulling force. What is its velocity at $t = 3.0$ s? (b) What is the normal force exerted by the floor on the block?

2. Three blocks are connected in a line by strings (as shown below) and are pulled across a horizontal frictionless floor. The pulling force is 6.5 N. The masses of the blocks are $m_1 = 1.2$ kg, $m_2 = 2.4$ kg, $m_3 = 3.1$ kg. (a) Find the tension is the string connecting blocks m_1 and m_2. (b) Starting from rest, the force is applied for a time of 2.4 s. What is the velocity of the system at the end of that time.
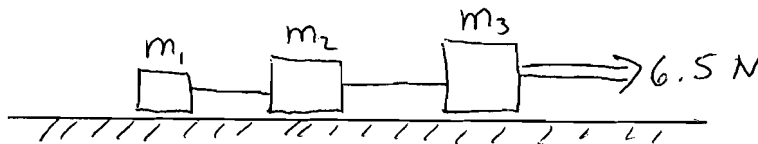
3. A block of mass $m_1 = 8.0$ kg on a horizontal frictionless surface is connected by a string over a frictionless pulley of negligible mass to a hanging block of mass $m_2 = 4.5$ kg (as shown below). (a) Find the tension in the string. (b) If the system is released from rest, find the speed of the two blocks after a time of 1.2 s.