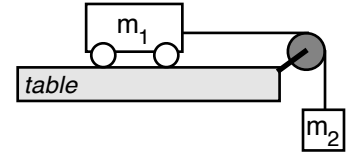


## Pulley Problems 1

In all of these problems, a cart of mass “ $m_1$ ” is on a horizontal table. There is a second mass “ $m_2$ ” that is connected to the first mass by a string that goes over a pulley. There is no friction.



- A. *What is Newton's Second Law?*
  - B. *In these problems, what is the net force causing the system to accelerate?*
  - C. *In these problems, what is the mass that is accelerating?*
  - D. *Turn Newton's Second Law into an equation that you can use to help solve these problems.*
1. If the cart's mass is 1.5 kg and the hanging mass is 0.2 kg, what is the acceleration of the masses?
  2. If the hanging mass is 0.25 kg and the masses are accelerating at  $3 \text{ m/s}^2$ , what is the cart's mass?
  3. If the mass on the table is 5 kg and  $m_2$  is 2 kg, what is the acceleration of the system?
  4. If the hanging mass is 250 grams, and the masses are accelerating at  $1.5 \text{ m/s}^2$ , what is the mass of the cart?
  5. A 150 gram mass is suspended from a string that goes around a pulley and is attached to a mass of 350 grams, which is resting on a horizontal frictionless table. What is the acceleration of the system?
  6. A 0.3 kg mass is suspended from a string that goes around a pulley and is attached to a second mass which is on a horizontal frictionless table. If the system is accelerating at  $6.5 \text{ m/s}^2$ , what is the second mass?
  - \*7. If  $m_1$  is 1.0 kg and the system is accelerating at  $2.5 \text{ m/s}^2$ , what is the mass  $m_2$ ?
  - \*8. If the mass on the table is 2.5 kg and the system is accelerating at  $3.5 \text{ m/s}^2$ , what is the hanging mass?

Answers:      1)  $1.18 \text{ m/s}^2$       2)  $0.58 \text{ kg}$       3)  $2.86 \text{ m/s}^2$       4)  $1.42 \text{ kg}$       5)  $3.00 \text{ m/s}^2$       6)  $0.16 \text{ kg}$   
                   7)  $0.33 \text{ kg}$             8)  $1.35 \text{ kg}$