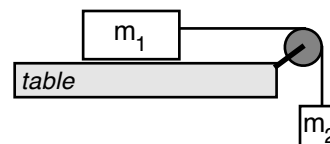


## Pulley Problems 2

In all of these problems, a 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 friction between the mass on the table and the table, (which we can call " $f$ ")



- What is Newton's Second Law?*
  - In these problems, what is the force causing the system to accelerate?*
  - In these problems, what is the force trying to stop the acceleration?*
  - So in these problems, what is the net force on the system?*
  - In these problems, what is the mass that is accelerating?*
  - Turn Newton's Second Law into an equation that you can use to help solve these problems.*
- If the mass on the table is 1.25 kg, the hanging mass is 0.3 kg and there is a frictional force of 2 N, what is the acceleration of the system?
  - If the mass on the table is 0.75 kg, the hanging mass is 0.15 kg and the system is accelerating at  $0.8 \text{ m/s}^2$ , what is the force of friction?
  - If the hanging mass is 0.4 kg, the force of friction is 2.5 N and the system is accelerating at  $0.7 \text{ m/s}^2$ , what is mass on the table?
  - If both masses are 5 kg, and the system is accelerating at  $3 \text{ m/s}^2$ , what is the force of friction?
  - If  $m_1$  is 0.3 kg and  $m_2$  is 0.5 kg and there is a frictional force of 1.5 N, what is the acceleration of the system?

## Pulley Problems 2

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6. If  $m_1$  is 2.2 kg and  $m_2$  is 750 grams and the system is accelerating at  $1.6 \text{ m/s}^2$ , what is the force of friction?
  
7. If the hanging mass is 500 grams, there is a frictional force of 2.2 N and the system is accelerating at  $1.7 \text{ m/s}^2$ , what is the mass on the table?
  
8. A mass of 250 grams is suspended from a string that goes around a pulley and is connected to a mass of 900 grams. The 900 gram mass is on a horizontal table and there is a frictional force of 1.8 N. What is the acceleration of the system?
  
9. A 1.1 kg mass is hanging from a string connected via a pulley to a mass of 0.75 kg which is on a horizontal table. If the system is accelerating at  $4.5 \text{ m/s}^2$ , what is the force of friction?
  
- \*10. If  $m_1$  is 1.2 kg and there is a frictional force of 6 N and the system is accelerating at  $0.9 \text{ m/s}^2$ , what is the mass  $m_2$ ?

Answers:      1)  $0.65 \text{ m/s}^2$       2)  $0.78 \text{ N}$       3)  $1.74 \text{ kg}$       4)  $20 \text{ N}$       5)  $4.38 \text{ m/s}^2$       6)  $2.78 \text{ N}$   
                  7)  $1.15 \text{ kg}$       8)  $0.61 \text{ m/s}^2$       9)  $2.68 \text{ N}$       10)  $0.78 \text{ kg}$