

1. An object with a mass of 1 kg is thrown straight up with an initial speed of  $40 \text{ m/s}$ .
  - a) Identify all forces acting on the object immediate after it is thrown, when it is midway to the top of its trajectory traveling up, when it is at the top of its trajectory, when it is midway to the bottom of its trajectory, and when it is at its original height.
  - b) What is the acceleration of the object at the five moments listed above?
  - c) How much time does it take, from the instant the object is thrown, to reach each of the five moments listed above?
  - d) What is the height of the object at the five moments listed above?
  - e) What is the speed of the object at the five moments listed above?

2. An object with a mass of 1 kg is thrown with an initial velocity of  $30 \text{ m/s } \hat{x} + 40 \text{ m/s } \hat{y}$ .
- Identify all forces acting on the object immediate after it is thrown, when it is midway to the top of its trajectory traveling up, when it is at the top of its trajectory, when it is midway to the bottom of its trajectory, and when it is at its original height.
  - What is the acceleration of the object at the five moments listed above?
  - How much time does it take, from the instant the object is thrown, to reach each of the five moments listed above?
  - What is the height of the object at the five moments listed above?
  - What is the speed of the object at the five moments listed above?
  - How far does the object travel in the  $x$  direction before reaching its original height?