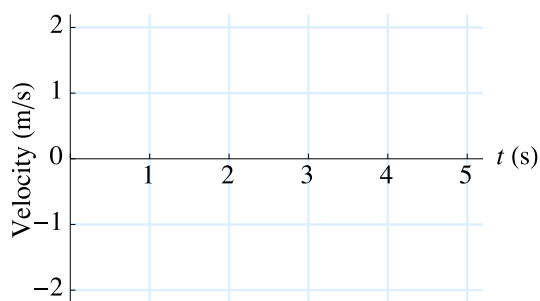
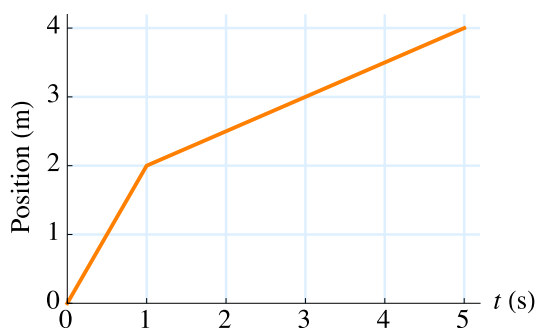


HOMWORK FOR UNIT 3

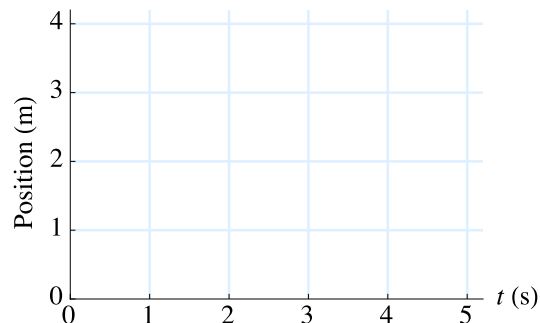
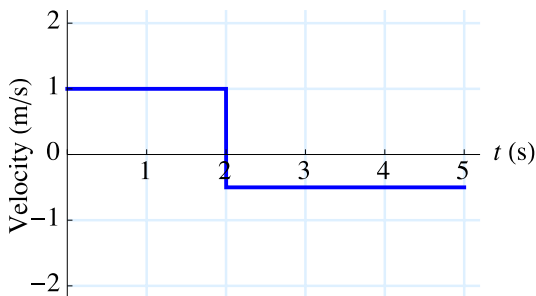
CHANGING MOTION I

Unless otherwise noted, each numbered question is worth 2 points

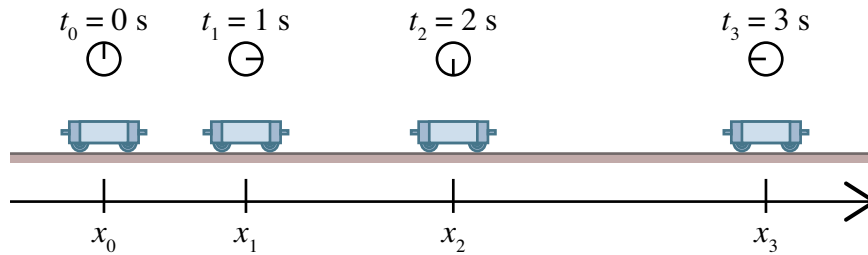
1. Draw the velocity graph for an object whose motion produced the position-time graph shown below. Position is in meters and velocity in meters per second. **Note:** Unlike most real objects, you can assume these objects can change velocity so quickly that it looks instantaneous with this time scale.



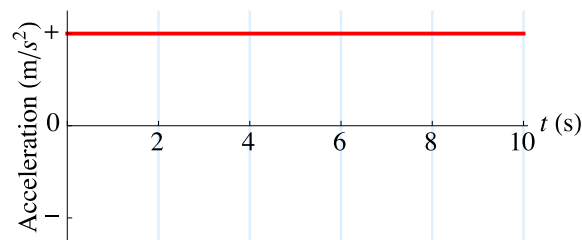
2. Draw the position graph for an object whose motion produced the velocity-time graph shown below. Position is in meters and velocity in meters per second. **Note:** Unlike most real objects, you can assume these objects can change velocity so quickly that it looks instantaneous with this time scale. Assume that the object starts out at a position of 2.0 meters at $t = 0.0$ seconds.



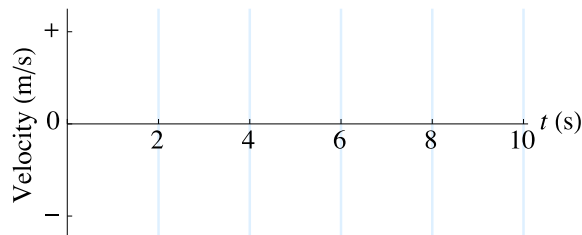
3. The diagram that follows shows the positions of the cart at equal time intervals. At each indicated time, sketch a vector above the cart that might represent the velocity of the cart at that time while it is moving away from the motion sensor and speeding up.



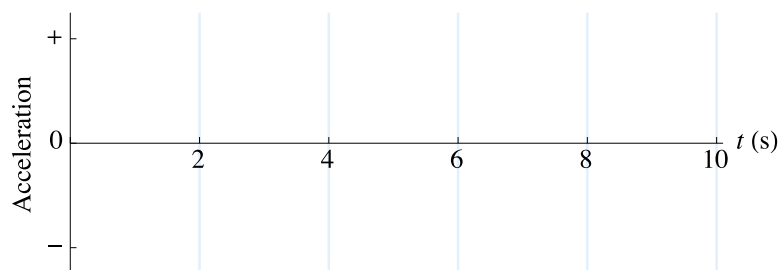
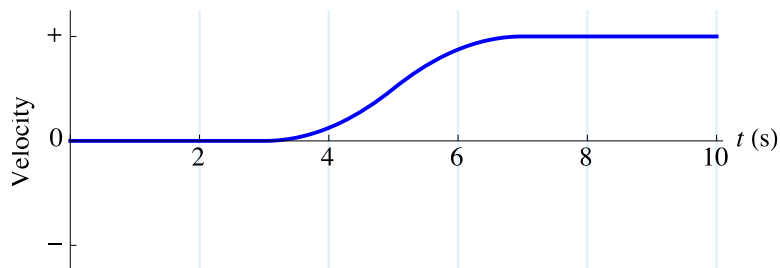
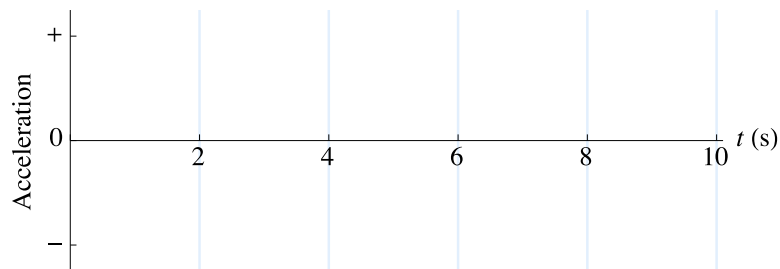
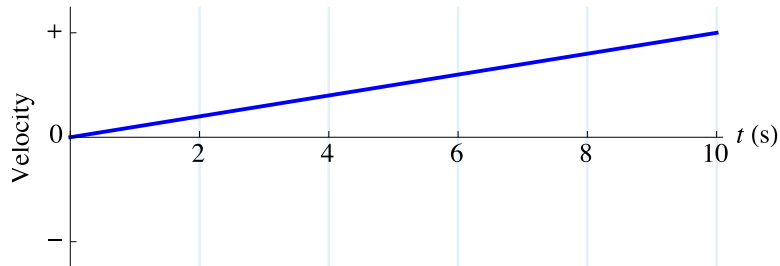
4. (4 pts) An object moving along a line (the + position axis) has the acceleration-time graph below.



- a. Describe how the object might move to create this graph if it is moving away from the origin.
- b. Sketch with a solid line on the axes below a velocity-time graph that goes with the motion described in (a).



5. (4 pts) For each of the velocity-time graphs below, sketch the shape of the acceleration-time graph that goes with it.

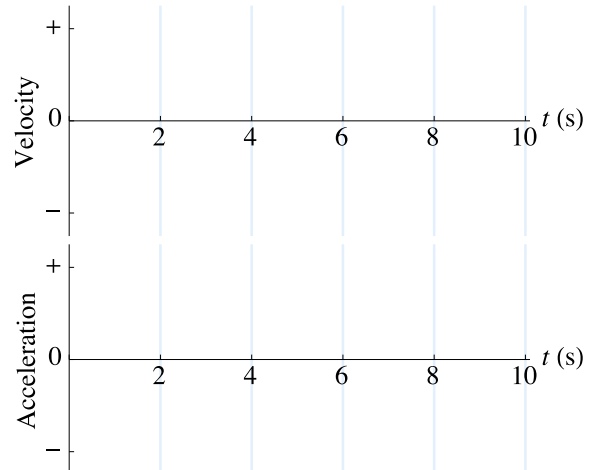


6. (6 pts) A car can move along a line (the + position axis). Sketch velocity-time and acceleration-time graphs that correspond to each of the following descriptions of the car's motion.

- a. The car starts from rest and moves toward the origin, increasing its speed at a steady rate.



- b. The car is moving away from the origin at a constant velocity.



- c. The car starts from rest and moves away from the origin, increasing its speed at a steady rate twice as large as in (a) above.

