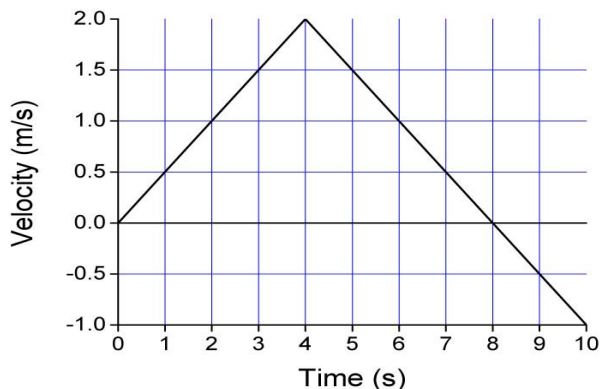


PHYS 115 Section 0101
 Spring 2008
 Due May 12, Monday
Problem 1 (20 points)

- A. The equation for distance vs. time can be expressed as $d = d_0 + v_0t + (1/2)at^2$ when there is a constant acceleration. The velocity vs. time can then be written as $v = v_0 + at$. For each of the following plot, describe the motion and draw the distance vs. time, velocity vs. time, and acceleration vs. time graphs. Draw all four plots on the same graph. Explain how and why each of the 4 plots is different from each other in the distance vs time and velocity vs time and acceleration time graphs. Also explain how the velocity time graphs are consistent with the distance-time graphs based on arguments of slope and intercept.
- $d = 0.5\text{m} + (0.2\text{m/s})t - (0.05\text{ m/s}^2)t^2$.
 - $d = 0.5\text{m} - (0.25\text{m/s})t - (0.06\text{ m/s}^2)t^2$.
 - $d = -0.5\text{m} - (0.3\text{m/s})t + (0.10\text{ m/s}^2)t^2$.
 - $d = -0.5\text{m} + (0.3\text{m/s})t + (0.10\text{ m/s}^2)t^2$.

Problem # 2. 20 points

- A. For the graph shown below, sketch a corresponding position time graph assuming that the object starts at $d = 1\text{ m}$. This does not need to be exact, but should capture the essential shape. Describe the motion in words.
- B. What is the acceleration between $t = 0$ and $t = 4$ seconds? Between $t = 4$ and $t = 10$ seconds?
- C. Calculate the distance travelled from $t = 0\text{ s}$ to $t = 4\text{ s}$ and from $t = 4\text{ s}$ to $t = 8\text{ s}$.
- D. Write the equation for distance vs. time and velocity vs. time from $t = 0$ to $t = 4$ seconds.



Problem 3, 10 points

Two cars start at the same place. One moves at a constant speed of 20 m/s . The other starts standing still, but accelerates with a constant acceleration of 3 m/s^2 . Write an equation for the velocity as a function of time for each car. When do they have the same velocity? Write an equation for the position as a function of time for each car. How far has each car gone after 10 seconds?