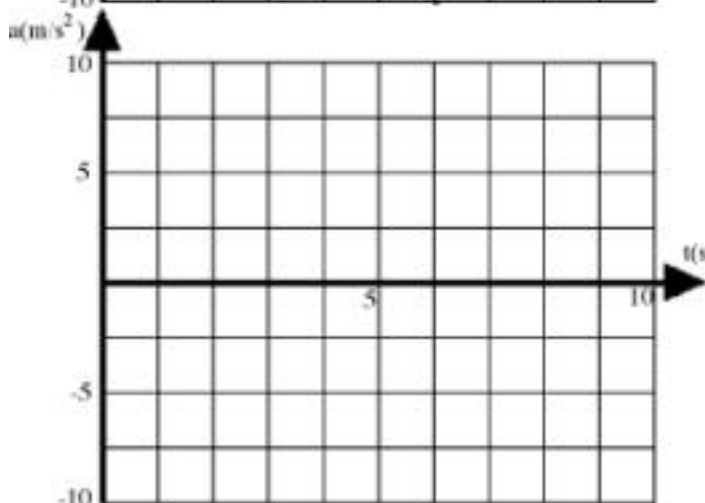
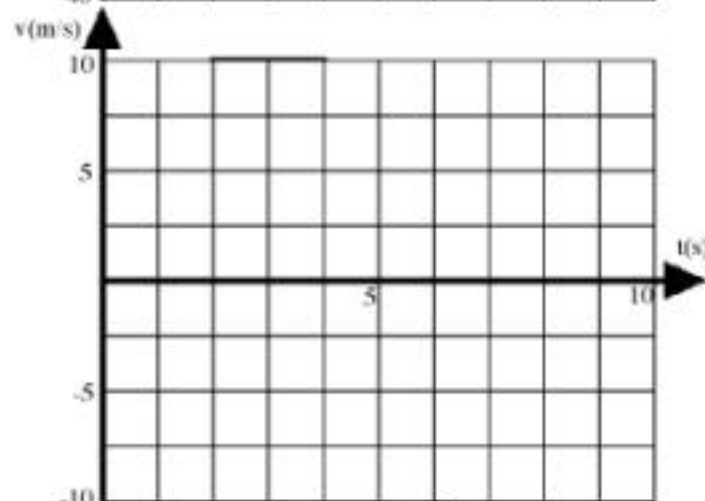
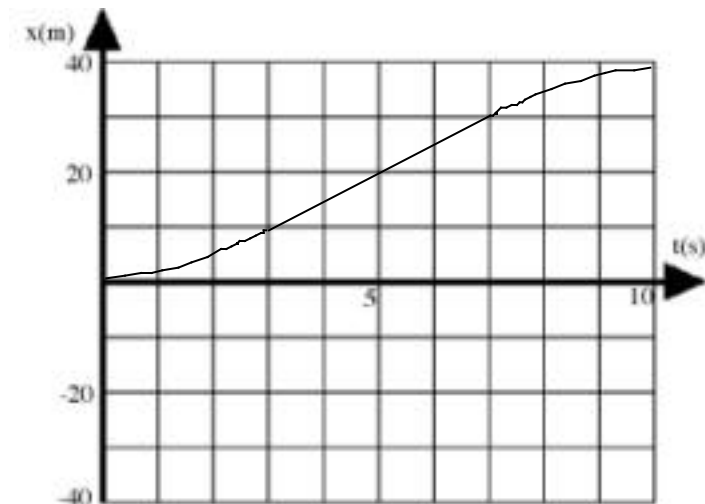


Name: _____

Solve the following problems in the space provided. Use the back of the page if needed. Each problem is worth 20 points. You must show your work in a logical fashion starting with the correctly applied physical principles which are on the last page. Your score will be maximized if your work is easy to follow because partial credit will be awarded.

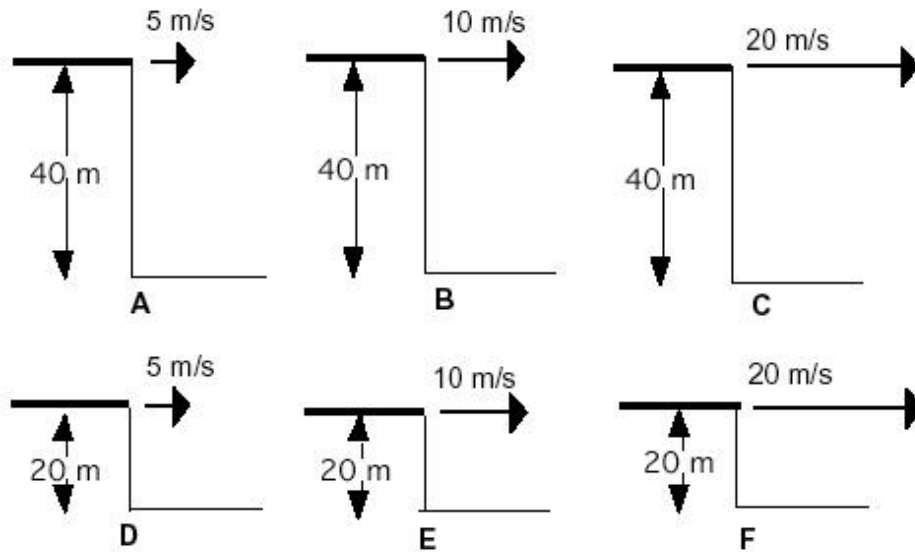
1. The position of a car as a function of time is shown in the graph at the right. (a) Explain how you would go about sketching the velocity versus time graph and draw the curve. (b) Explain how you would go about sketching the acceleration versus time graph and draw the curve.



2. In a crazy movie stunt, a car traveling at 80.0m/s collides with and passes through a 3.00m thick wall of jello emerging with a speed of 40.0m/s . Find (a) the time required for the car to pass through the jello and (b) the acceleration of the car (assumed constant) as it passes through.

3. A plane flies 788miles at 48.0° north of east to go from Dallas to Chicago. The plane then travels 560miles at 69.0° south of east to get to Atlanta. Find the distance and direction that a plane would have to travel directly from Dallas to Atlanta.

4. Pictured below are six waterfalls all of which have the same amount of water flowing over them. The waterfalls differ in height and in the speed of the water as it goes over the edge. The specific values of the heights and speeds are given in the figures. Rank these situations from longest to shortest based on how long it takes the water to go from the top of the falls to the bottom. That is, put first the situation where it takes the water the most time to go from the top of the falls to the bottom, and put last the one that takes the least time. If two or more take equal times, then state so. Explain your reasoning for full credit.



5. A 15.0m diameter Ferris Wheel turns at a constant rate of 0.700 revolutions per minute. Find the distance traveled by a passenger in one rotation, (b) the velocity (magnitude and direction) of the passengers when they are half way up, and (c) the acceleration (magnitude and direction) of the passengers when they are halfway up.