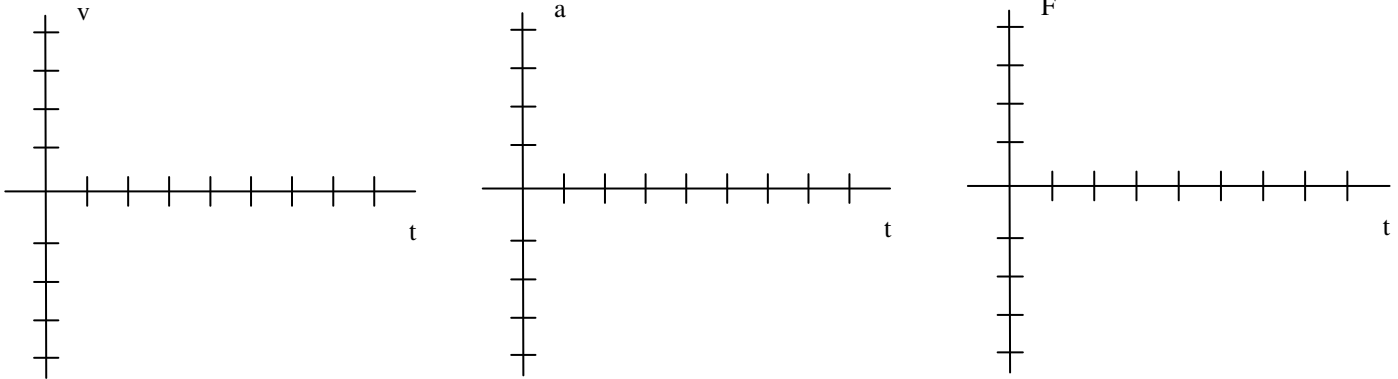


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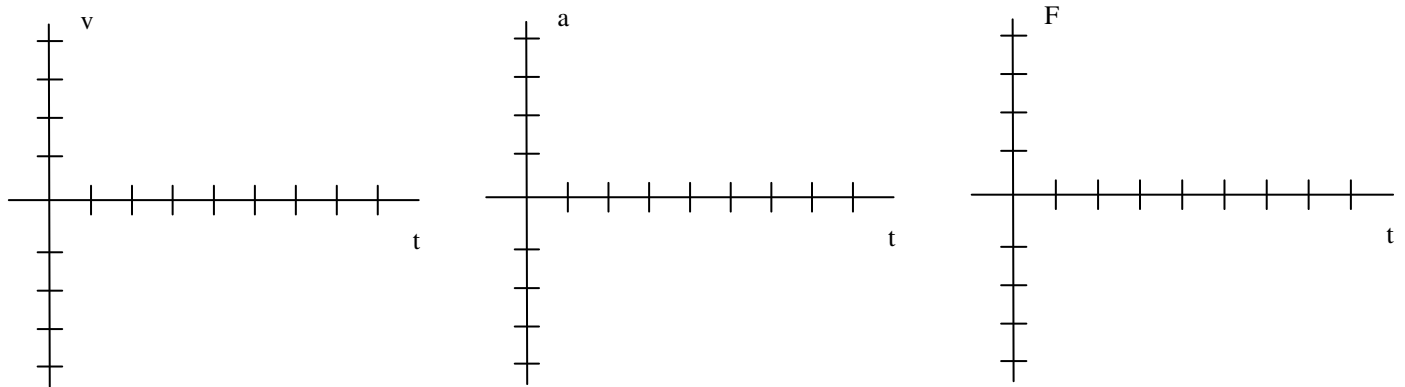
### Physics 200B Lab 5 homework

Questions 1-3 refer to an object that can move in either direction along a horizontal line (the + x axis). Assume that friction is so small that it can be neglected. Sketch the shape of the graphs of velocity vs. time, acceleration vs. time, and of the force applied to the object that would produce the motion described.

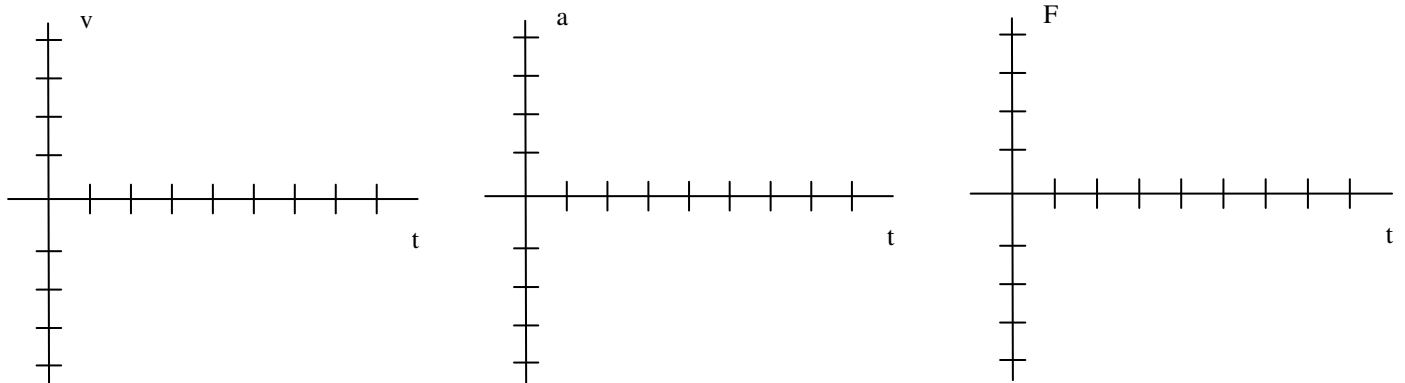
1. The object moves away from the origin with a constant velocity.



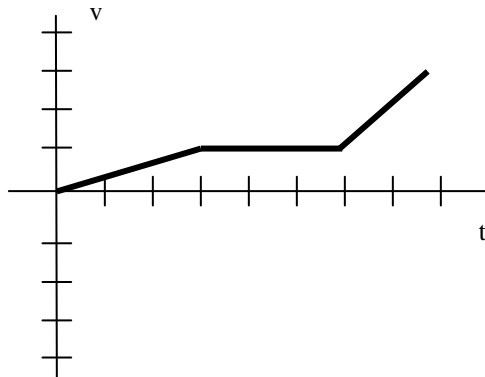
2. The object moves toward the origin with a constant velocity.



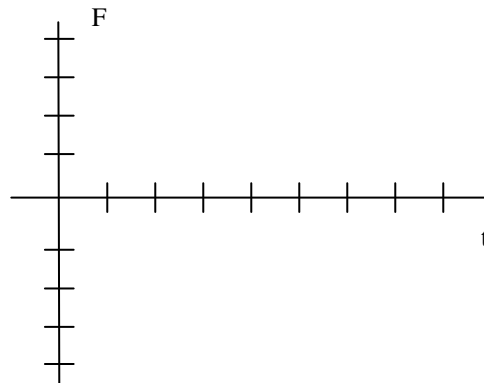
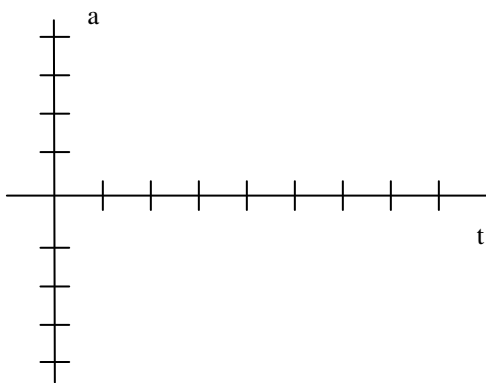
3. The object moves away from the origin with a steadily increasing velocity (constant acceleration).



4. An object can move along a horizontal line (the +x position axis). Assume that friction is so small that it can be ignored. The object's velocity-time graph is shown below.

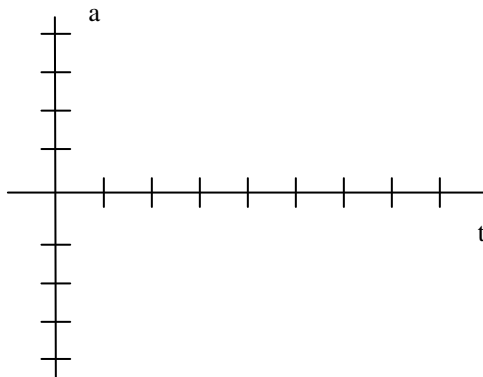


Sketch the shapes of the acceleration and force graphs on the axes below.



Questions 5-6 refer to a toy car that can move in either direction along a horizontal line (the +x axis). Assume that friction is so small that it can be ignored. A force of constant magnitude in the +x direction is applied to the car.

5. Sketch on the axes below using a solid line the shape of the car's acceleration-time graph.



6. Suppose that the mass of the car were twice as large. The same constant force is applied to the car. Sketch on the axes above using a dashed line the car's acceleration-time graph. Explain any differences in this graph compared to the car's acceleration-time graph with the original mass.

7. What is meant by a proportional relationship? Is this the same as a linear relationship? Explain (a sketch of a graph might help). How would you determine if the relationship between two different variables is a proportional one?