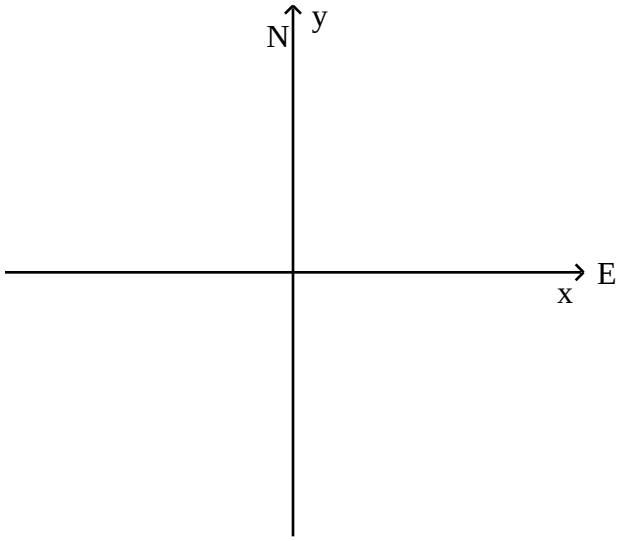
Name:_____

Physics 4A FIRST EXAM Chapters 1 - 4 Fall 1993

Solve the following problems in the space provided. Use the back of the pages if needed. Each problem is worth 20 points. You must show your work in a logical fashion. At the very least you must state the names of physical principles that you use. You may use the information on the last page. Your score will be maximized if your work is easy to follow because partial credit will be awarded.

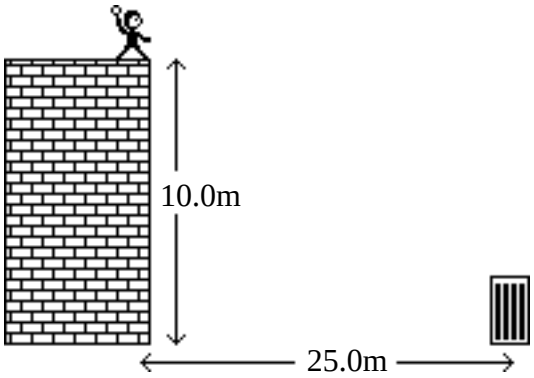
1. Many objects do not undergo constant acceleration and therefore the kinematic equations do not apply. If you happen to know the acceleration as a function of time for such an object, describe how you would go about finding the velocity at any time and the position at any time. Besides the acceleration as a function of time, there are two additional pieces of information you would need. What are they?

2. A tropical storm was centered 400km away from Honolulu at 30.0˚ south of east. Six hours later the storm is centered 200km due north. (a)Find the displacement (magnitude and direction) of the storm during this time, (b)show the initial position, final position, and displacement below and (c)find the average velocity of the storm.



3. A skydiver falling at 180km/h opens her parachute and slows to 10.0km/h. Assuming her deceleration is a constant 1.35g's, find the time it takes her to slow down and the distance she travels during that time.

4. A physics student standing on top of the physical science building wants to throw a rock into a garbage can on the ground. The student plans to throw the rock horizontally from a height of 10.0m. The garbage can is 25.0m away from the edge of the building. Find the speed that the rock should be thrown.



5. A 1.00m diameter ceiling fan is switched on and begins to speed up. It takes 30.0s to reach its final speed of 80.0rpm. Assume that the acceleration of the tip of the fan blades is constant and find the magnitudes of the radial, tangential, and total acceleration when the fan was moving at 40.0rpm.