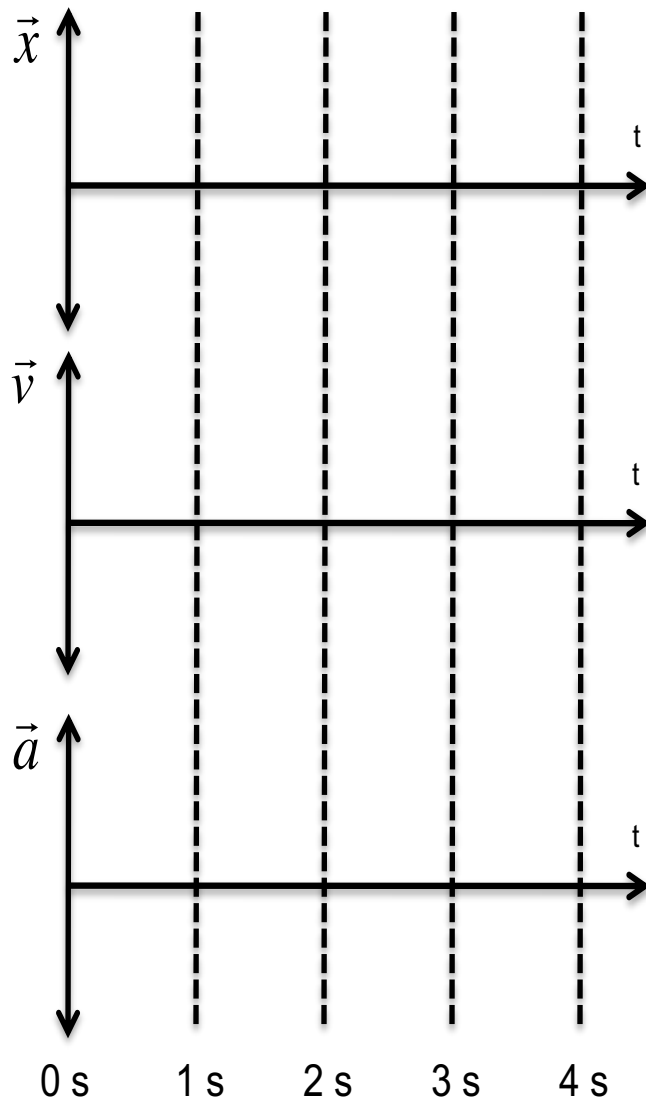


You will be graded on your communication of physics understanding.

#1 Your friend has a mass of 50 kg and is standing on a scale inside a 1000 kg elevator.

At a height of 20 m ($t = 0$) she notices that she's moving upwards with constant speed 8 m/s. She continues at this speed for 1 second and then comes to rest at a rate of 4 m/s^2 . Please make the graphs describing her motion. Label the axes to make the values explicitly clear and show what her final height is if you can. The horizontal axes do not have to indicate $y = 0$.



#2 In the problem above what does the scale your friend is standing on read at $t = 0$, and at $t = 2$ s. Remember to show your work and thought process completely. Think of convincing someone who is skeptical.

#3 Jane (50 kg) is glad to see Tarzan (100 kg) and is running toward him at 5 m/s to give him a big hug. He is standing in a tree 5 m above the ground and swings down in the opposite direction to hug her. **Ka-smack!** They hit each other just as Tarzan reaches the ground, and they swing off together.

- a) Please explain exactly how you would calculate the final speed of these two people holding the vine (and each other).
- b) Please also set up the equations.
- c) If you are able, please find their final speed indicating direction.

#4 Your friend is on a sled (combined mass: 100 kg) moving at a speed of 2 m/s on flat, smooth snow. To speed him up, you push him forward with a force of 200 N over 8 m.

a) Please find my friend's final speed after I am done pushing him.

b) Explain how you would estimate the average power I put out as I push him. You don't have to calculate it.

Name _____