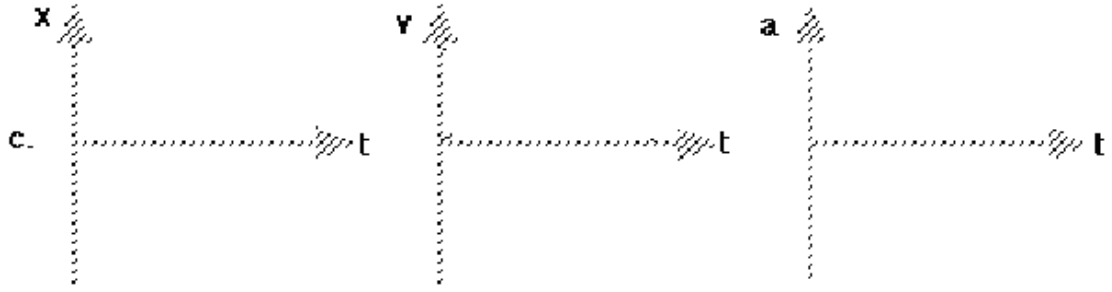
Midterm Review

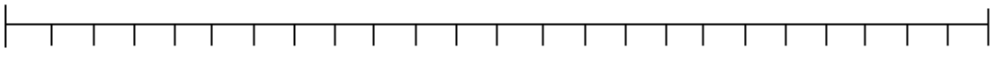
Term	Symbol	Units	Definitions
Displacement			
Position			
Velocity			
Speed			
Time			
Acceleration			
Coefficient of Friction			
Force			
Net Force			
Spring Constant			
Mass			
Gravitational Constant			

1. A 20, 000 kg truck slows from 40 m/s to 20 m/s in 10 s.

a) Draw the corresponding qualitative x vs t, v vs t, and a vs t graphs.



b) Sketch out a motion Diagram for the situation above.



c) What is the displacement of the bus?

d) What is the acceleration of the bus?

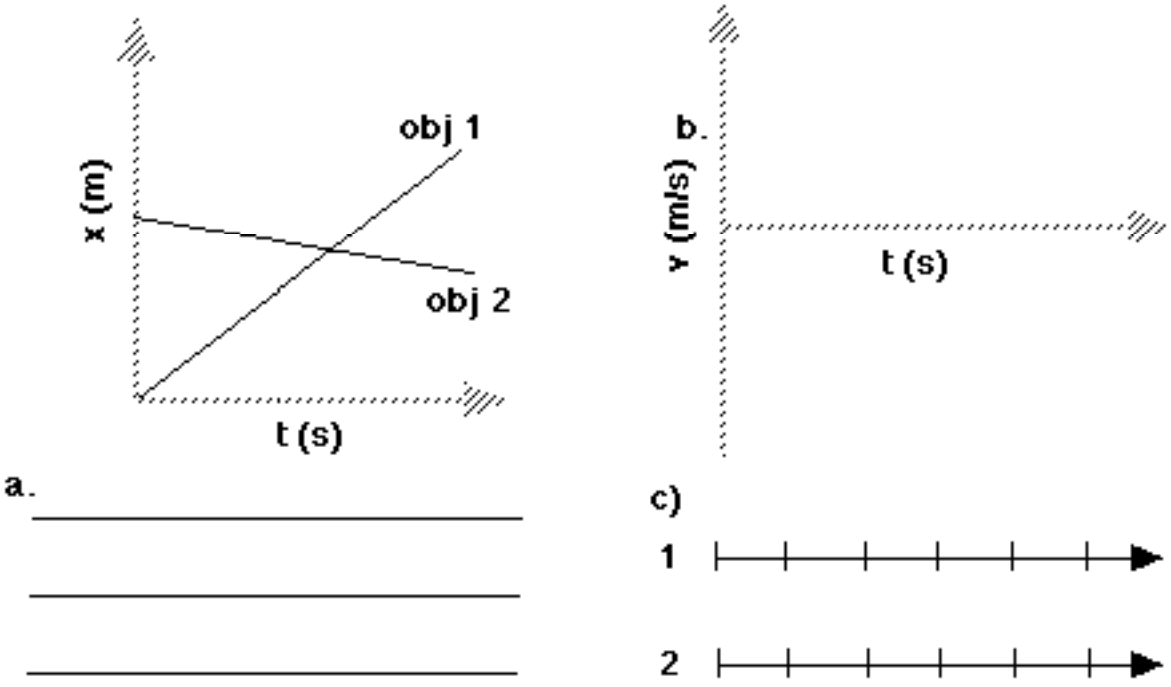
d) How fast would the bus be traveling at 5s?

e) Assuming the acceleration stays uniform, how long will it take for the bus to come to a complete stop?

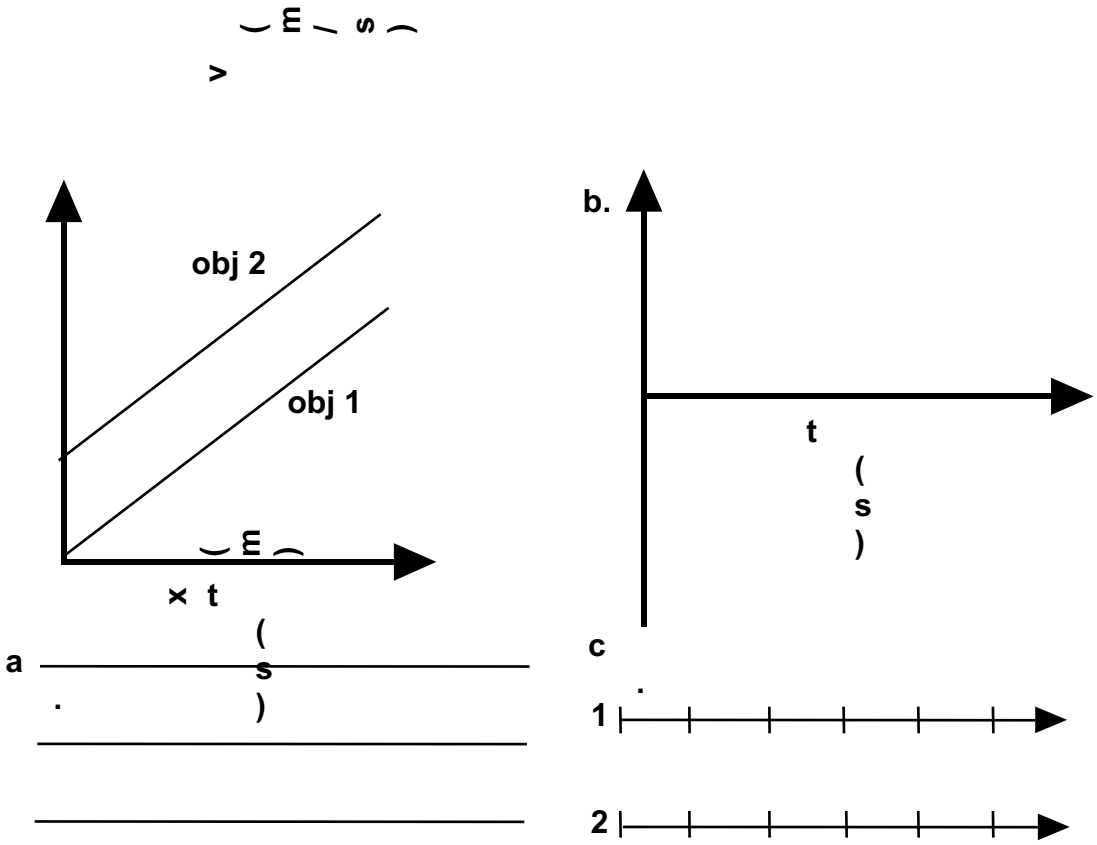
f) What is the Net Force on the bus?

g) Draw the free body diagram for the bus.

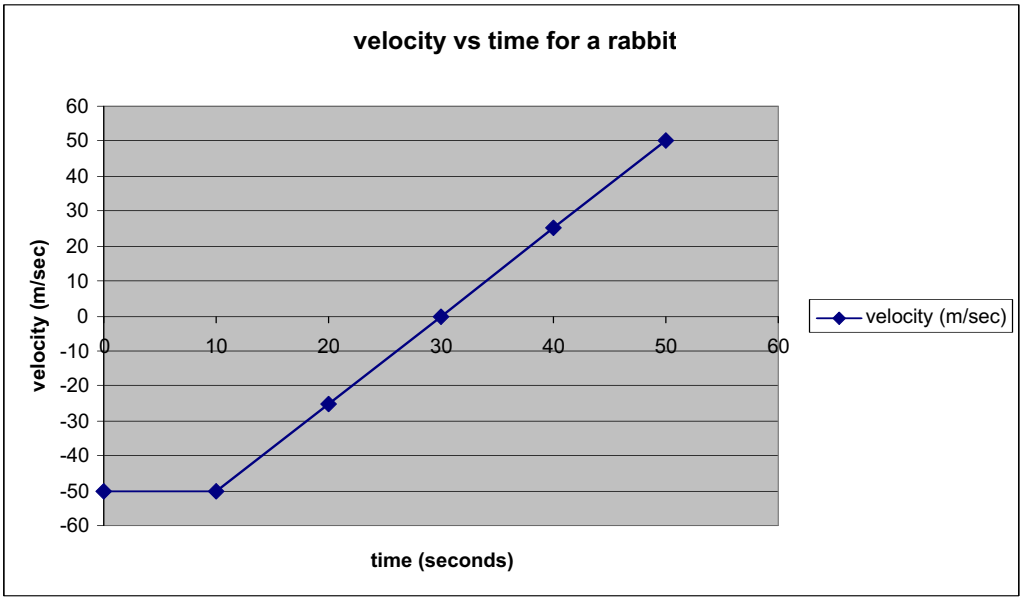
2.



3.

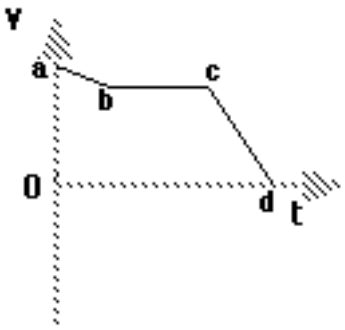


4. A rabbit pops out of its hole and begins running for not quite a full minute, as shown on the velocity time graph below.

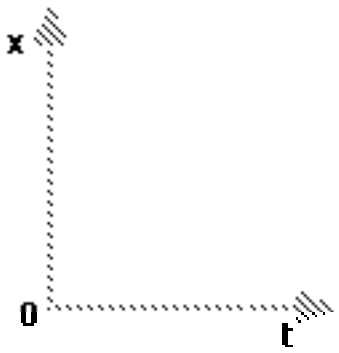


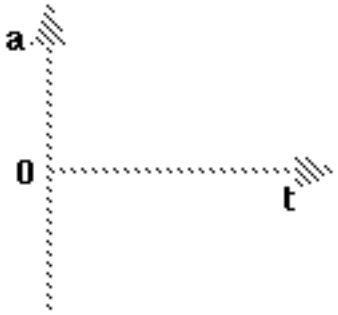
How many times does it run past its own hole during the fifty second interval? Explain how you know.

5. Below is the velocity vs. time graph for a train. Use the graph to answer the following questions.



a) Draw the position vs. time and acceleration vs. time graphs corresponding to the velocity graph between points **c** and **d**.



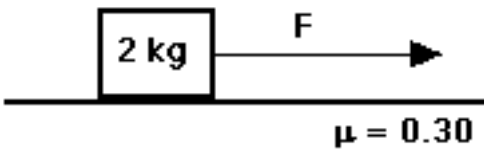


b) Describe the motion of the train from a to b. Explain your reasoning.

c) Is the net force on the train equal to zero at any time? Explain your reasoning.

d) Where is the net force on the train the largest? Explain your reasoning.

6. Consider the block on a surface below.
The coefficient of friction, μ, is 0.30.



a. If a 10. N force is applied to the block, what is its acceleration?

b. How fast will the block be moving if the force is applied for 8.0s?

c. How far will the block have traveled during this 8.0s period?

7. Connie flew from Phoenix to Flagstaff, a distance of 180 miles at a constant speed of 180 mph. She then returned at a constant speed of 90. mph. What was her:

a. trip distance? _____ c. average speed? _____

b. displacement? _____ d. average velocity?_____