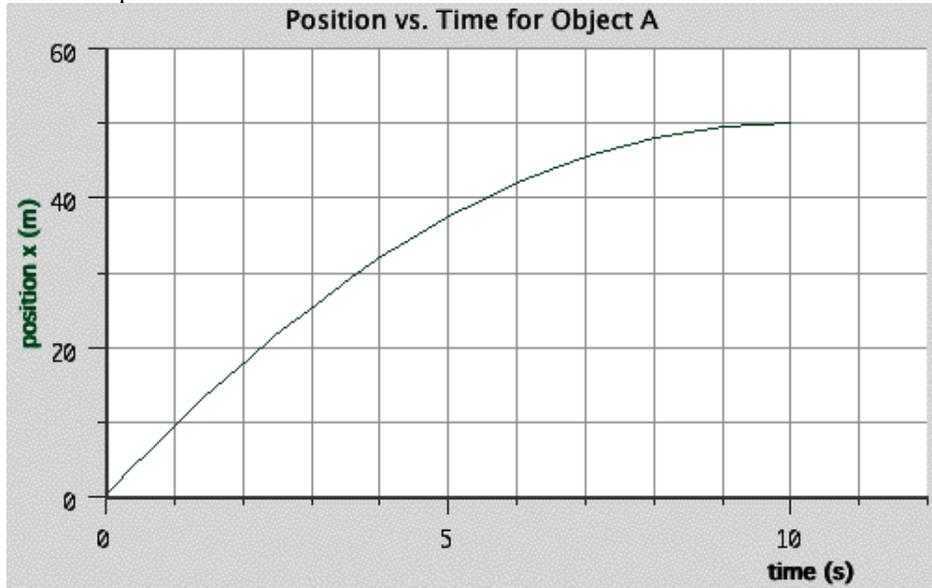**Name** _____ **Date** _____ **Period** _____

Unit 1: Review

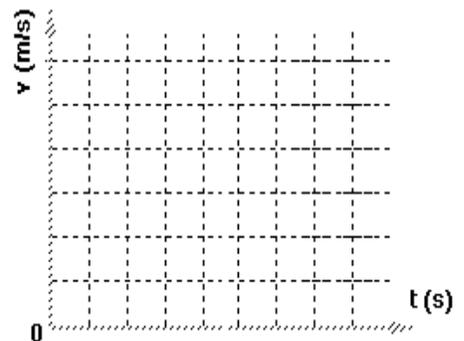Use the graph below to answer questions #1-4 that follow:

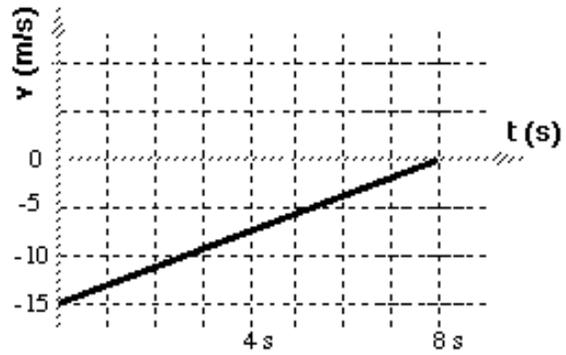1. Give a written description to describe the motion of this object.

2. Explain how you could determine the instantaneous velocity of the object at $t = 2$ s.

3. Assume the initial velocity was 10 m/s; determine the acceleration of the object.

4. Sketch a corresponding qualitiative velocity time graph for the graph above.

Use this graph to answer questions 5 - 8. .

5. Determine the acceleration of the object from the graph.

6. Shade the portion of the graph that represents the displacement of the object from 2 to 6 seconds.

7. Use an appropriate equation to calculate the velocity of the object at 2 seconds and at 6 seconds.

8. Use an appropriate equation to calculate the object's displacement from 2 to 6 seconds.

9. Using the graph below, compare the kinematical behavior of the two objects.
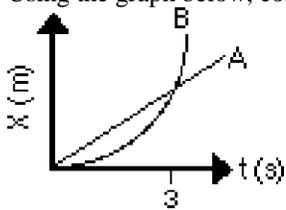
Comparison:	is A > B, A < B, or A = B	How do you know?
a. Displacement at 3 s		
b. **Average** velocity from 0- 3 s		
c. **Instantaneous** velocity at 3 s		

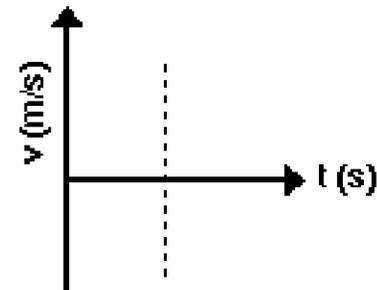10. Using the graph below, compare the kinematical behavior of the two objects.
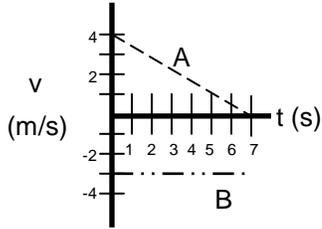
Comparison:	is A > B, A < B, or A = B	How do you know?
a. Displacement at 7 s		
b. **Average** velocity from 0- 7 s		
c. Acceleration at 3 s		

11. For each of the position vs time graphs shown below, draw the corresponding
    v vs **t**, **a** vs **t** , and motion map.
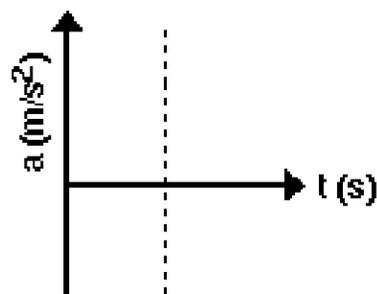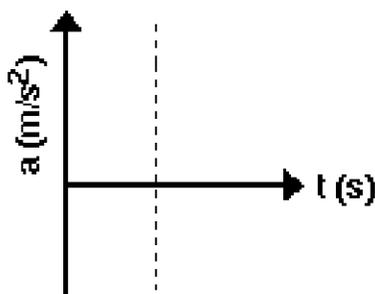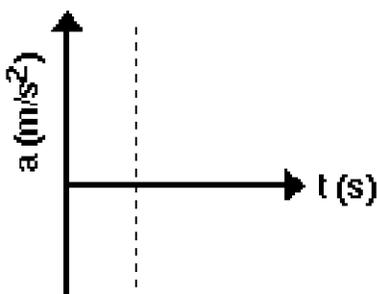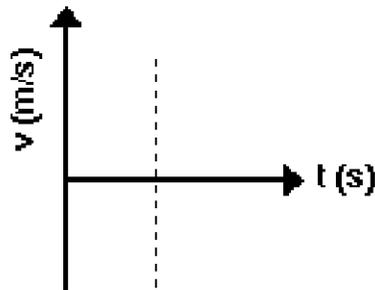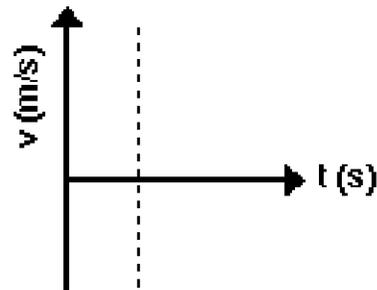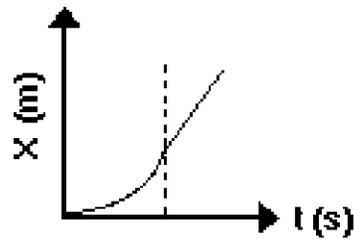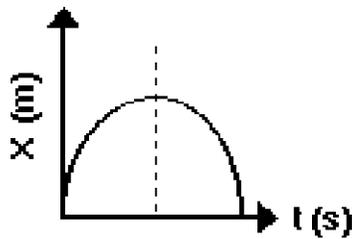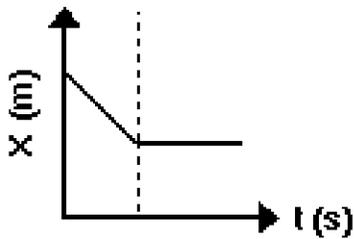
12. In the Wizard of Oz, Dorothy awakens in Munchkinland where her house has been blown by a tornado. If the house fell from a height of 3000 m, with what speed did it hit the Wicked Witch of the East when it landed?

14. On June 9, 1988, Sergei Bubka broke the world pole vaulting record for the 8th time in four years by attaining a height of 6.10 m. How lond did it take Bubka to return to the ground from the highest part of the vault?

13. The Tambora volcano on the island of Sumbaway, Indonesia has been known to throw ash into the air with a speed of 625 m/s during an eruption. A) How high could this volcanic plume have risen? B) On Venus, where the acceleration due to gravity is slightly less than on Earth, would the plume rise higher then it does on Earth?

15. Perhaps sometime in the future, NASA will develop a program to land a human being on Mars. If you were the first Mars explorer and discovered that when you dropped a hammer it took 0.68 s to fall 0.9 m to the ground, what would you calculate for the gravitational acceleration on Mars?

16. A skateboarder is moving at a constant velocity of 1.75 m/s when she starts up an incline that causes her to slow down with a constant acceleration of 0.20 m/s^2. A) How much time passes from when she begins to slow down until she stops? B) How far does she travel?

18. A 2 m tall cannon shoots a cannonball straight up. A) If the cannon ball reaches a maximum **height** of 18 m, what is the initial velocity? B) How much time does it take for the cannon ball to get back to the same height that it started? C) How fast is the cannonball going when it is at a height of 0.5 m?

17. A car accelerates at a constant rate from 15 m/s to 25 m/s while it travels a distance of 125m. How long does it take to achieve this speed?

19. A car accelerates from rest when the light turns green and reaches a speed of 25 m/s is 7 seconds. At this point the car travels for another 60 s, but now has to slow down to 10 m/s because of traffic. The car does this in 2 s. (a) How far did the car travel? (b) What was the average velocity of the car?