**Unit 3: Worksheet Review**

**position vs time**

0

1

2

3

4

5

6

7

8

9

10

0

10

20

30

40

50

**time (s)**

**position (m)**

1. Use the graph above to answer the following questions:

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

b. Draw the motion map for the object. Include velocity and acceleration vectors.

**vel:**

**acc:**

0m

+

c. Determine the instantaneous velocity of the object at **t** = 2 s and explain how you did it.

**velocity (m/s)**

**time (s)**

d. Assume the initial velocity was 10 m/s, determine the acceleration of the object.

e. Sketch a corresponding velocity time graph for the motion depicted by the positon graph above.

2. A car, initially at rest, accelerates at a constant rate of 4.0 m/s2 for 6 s. How fast will the car be traveling at **t** = 6 s?

3. Use the graph to answer the following questions.

a. Describe the motion of the object.

**15**

**velocity (m/s)**

**0**

**0 5 10**

***t* (s)**

**-15**

b. Determine the acceleration of the object from the graph.  
  
*(Note: velocity reaches the t-axis at t = 7.5 s.)*

c. Determine the displacement of the object during the time interval t = 0 s to t = 7.5 s two different ways: graphically and by using the equation 

d. A fellow student makes the claim that since the acceleration was (+) the object must have been speeding up over this time interval. How would you respond to this claim?

4. Draw a motion map, including both velocity and acceleration vectors for the cart on ramp situation shown below.



**vel:**

**acc:**

0m

+

5. Using the graph, compare the following quantities for objects A and B. **Is A > B, A < B, or A = B.**

**A**

**position (m)**

**3**

**time (s)**

**B**

1. **Displacement** from 0 to 3 s  \_\_\_\_\_\_\_\_\_\_\_ How do you know?
2. **Displacement** from 0 to 1.5 s \_\_\_\_\_\_\_\_\_\_\_ How do you know?
3. **Average** velocity from 0 to 3 s \_\_\_\_\_\_\_\_\_\_\_ How do you know?
4. **Instantaneous** velocity at 3 s \_\_\_\_\_\_\_\_\_\_\_ How do you know?

1. If the motion of B is uniformly accelerated, at what time will both graphs have exactly the same slope? Explain.

6. For each of the position vs time graphs shown below, draw the corresponding **v** vs **t**, **a** vs **t** , and motion map.

**+**

**-**

**velocity**

**+**

**-**

**time**

**time**

**time**

**position**

**acceleration**

**+**

**-**

**velocity**

**+**

**-**

**time**

**time**

**time**

**position**

**acceleration**

**+**

**-**

**velocity**

**+**

**-**

**time**

**time**

**time**

**position**

**acceleration**

**vel:**

**acc:**

0m

+

**vel:**

**acc:**

0m

+

**vel:**

**acc:**

0m

+