

Calculus Worksheet #9 Unit 1 page 1 _____

An object is propelled upward in such a way that its distance above the ground, s , (measured in feet) after t seconds is given by the function

$$s = f(t) = 240 + 32t - 16t^2, \text{ where } 0 \leq t \leq 5.$$

Answer the following questions.

1. Write a function for the velocity of the object in terms of t .
2. What is the maximum height that the object will reach above the ground?
3. How long will it take the object to reach its maximum height?
4. Describe the position and the velocity of the object when $t = 0$ s.
5. Describe the position and the velocity of the object when $t = 5$ s.
6. Fill out the table below giving the position (distance above the ground) and the velocity of the object for $t = 0$ s to $t = 5$ s.

time (seconds)	0	1	2	3	4	5
distance (feet)						
velocity (fps)						

7. Use the table above to sketch graphs of the distance and the velocity functions for values of t from 0 to 5.

Calculus Worksheet #9 Unit 1 page 2

A object moves on the line below in such a way that its distance, s (in inches), from point P after t seconds is given by the function

$$s = f(t) = 0.25t^2 - 2t + 3, \text{ where } t \geq 0.$$

(Assume that $s > 0$ when the object is to the right of point P and $s < 0$ when the object is to the left of point P .) Answer the following questions.



8. Write a function for the velocity of the object in terms of t .
 9. When is the object at point P ? There are two times.
 10. What is the velocity of the particle at each time it is at point P ?
 11. When is the object at rest?
 12. Describe the position of the object when it is at rest.
 13. Fill out the table below giving the position (relative to point P) and the velocity of the object for $t = 0$ s to $t = 10$ s.
- | time (seconds) | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------------|---|---|---|---|---|---|---|---|---|---|----|
| distance (inches) | | | | | | | | | | | |
| velocity (in./sec) | | | | | | | | | | | |
14. Use the table above to sketch graphs of the distance and the velocity functions for values of t from 0 to 10.