

MA 181

The Velocity Problem

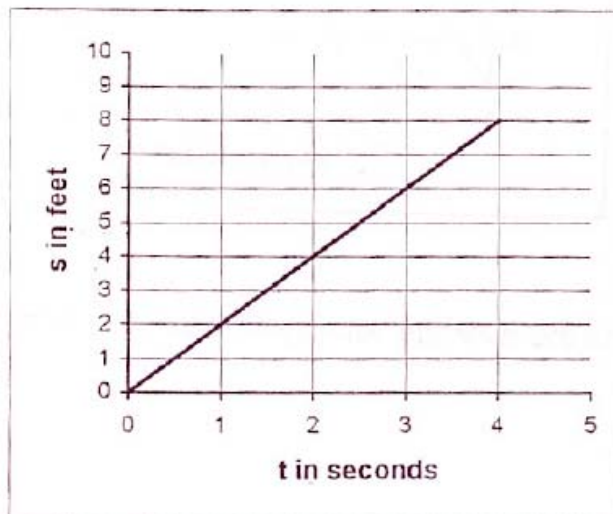
Section 2.1

1. Suppose that an object is traveling horizontally along a straight line. Table 1 below gives the distance it has traveled at time t .

Table 1

time t (in seconds)	0	1	2	3	4
distance s (in feet)	0	2	4	6	8

- (a) Is this object traveling at the same velocity throughout the time period? How do you know?
- (b) What is the velocity of the object at any time t in the given time period?
- (c) The data is plotted below.



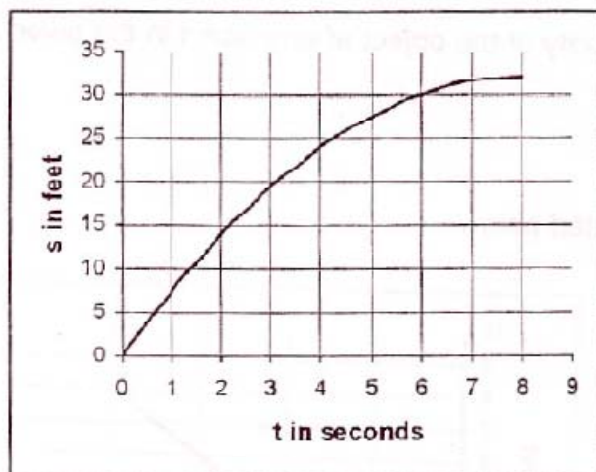
- (d) What characteristic of the graph corresponds to the velocity of the object?

2. A second object is also traveling horizontally along a straight line. Table 2 below gives the distance it has traveled at time t .

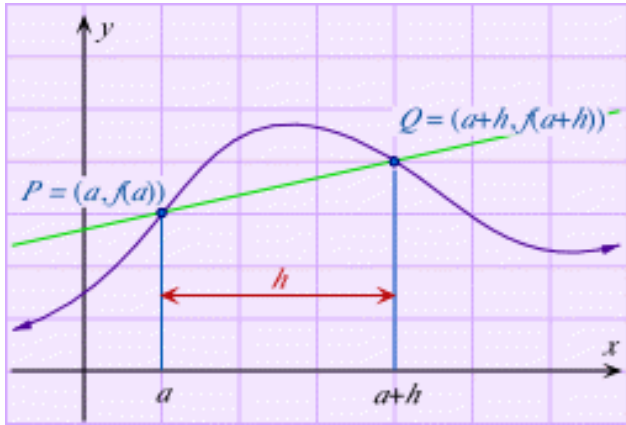
Table 2

time t (in seconds)	0	1	2	3	4	5	6	7	8
distance s (in feet)	0	7.5	14	19.5	24	27.5	30	31.5	32

- (a) Is this object traveling at the same velocity throughout the time period? How do you know? If the velocity is not the same, is it increasing or decreasing?
- (b) The data is plotted below.



- (c) Determine the average velocity of the object from $t = 3$ to $t = 4$.
- (d) How can you show this on the graph? Think about the connection between velocity and the graph in the previous example.
- (e) How could we use the graph to visualize the velocity of the object during the time interval $t = 3$ to $t = 3.5$? What about at $t = 3$?



<i>Slope of Secant Line</i>	<i>Slope of tangent line</i>

http://www.zweigmedia.com/RealWorld/tutorials/frames2_3.html

MA 181 Calculus I (Scott)

Sections 2.1

Assume your car has a broken speedometer for the following exercises.

1. In order to find my average velocity of a trip from Rockville, MD to Cumberland, MD, I need
 - a) the total distance of the trip
 - b) the highway mile markers
 - c) the time spent traveling
 - d) how many stops I made during the trip
 - e) a friend with a stop watch
 - f) a working odometer
 - g) none of the above

2. In order to find my velocity at the instant I hit a speed trap, I need
 - a) the total distance of the trip
 - b) the highway mile markers
 - c) the time spent traveling
 - d) how many stops I made during the trip
 - e) a friend with a stop watch
 - f) a working odometer
 - g) none of the above

3. Regarding the speed trap in *problem 2*, when should your friend first start the stopwatch?
 - a) When the vehicle in oncoming traffic flashes their headlights
 - b) When you spot the cop
 - c) either scenario
 - d) neither scenario