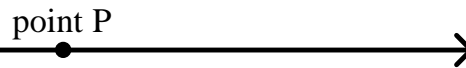
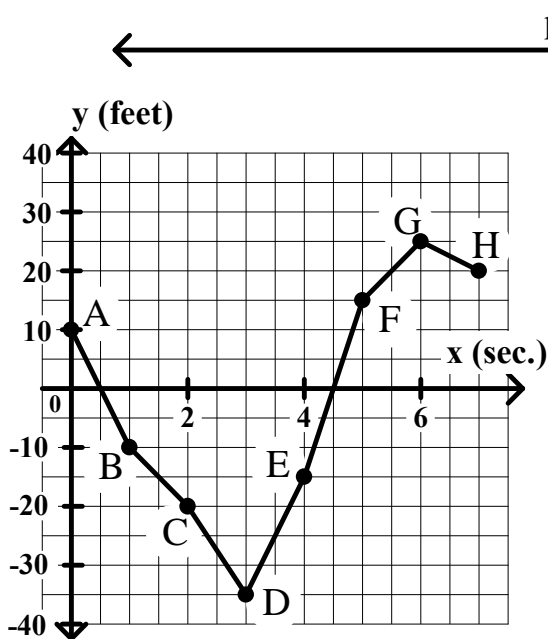


## Advanced Challenge Level 2 Problem #8

The diagram below shows a horizontal line with a fixed point P. Another point (not shown) is moving on this line. The graph below represents the movement of the point on the line.  $x$  represents the time in seconds that the point has been moving.  $y$  represents the distance in centimeters that the moving point is from point P. It is understood that if  $y > 0$ , then the moving point is to the right of point P, and if  $y < 0$ , then the moving point is to the left of point P. Answer the questions.



1. What was the speed and the direction of the moving point from  $t = 1$  to  $t = 2$  (seconds)?
2. What was the speed and the direction of the moving point from  $t = 5$  to  $t = 6$  (seconds)?
3. During which 1 second interval was the moving point going at its fastest speed? What was its fastest speed?
4. How far did the moving point travel from  $t = 0$  to  $t = 2$  seconds?
5. What was the average speed of the moving point from  $t = 0$  to  $t = 2$  seconds?
6. How far did the moving point travel from  $t = 3$  to  $t = 5$  seconds?
7. What was the average speed of the moving point from  $t = 3$  to  $t = 5$  seconds?
8. When was the moving point at point P? What was its speed and direction then?
9. What was the total distance moved by the point during the seven second interval shown?
10. How many times did the point change directions during the seven second interval shown?
11. What is the slope of line segment CD?
12. What is the slope of line segment FG?
13. What is the significance of slope in this problem? Make sure you discuss both the magnitude of the slope and the sign (positive or negative) of the slope in your answer to this question.
14. What units should be associated with each of the slopes you gave in questions 11 and 12?