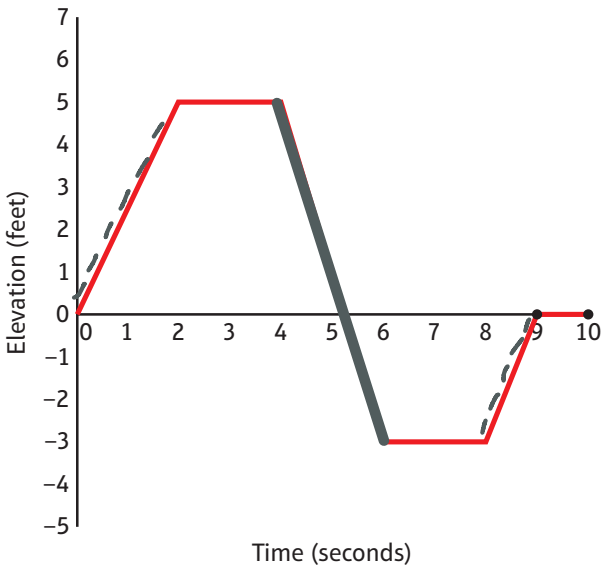
NAME: _____ PERIOD: _____ DATE: _____

# Homework Problem Set

1. A. Create an elevation-versus-time graphing story for the following graph:




My story:

Answers will vary

B. What is the domain and range of this graph? Write your answer in interval notation.

DOMAIN: [0,10]

RANGE: [-3,5]

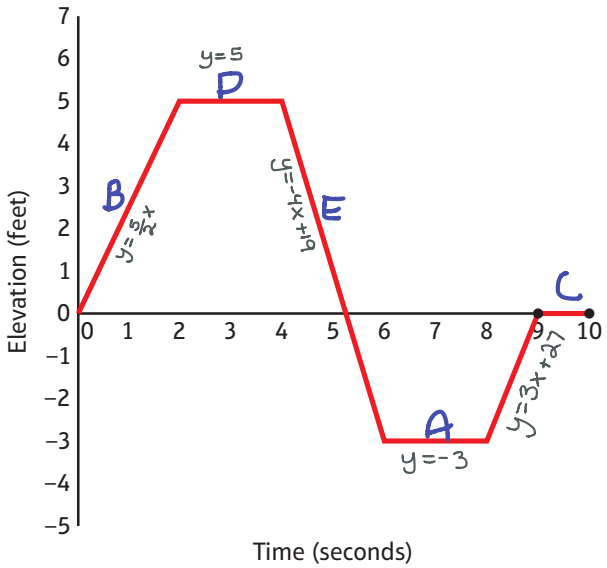
C. Mark the graph to show where it is increasing, decreasing or constant. Use the code below.

Dashed segments (- - - - -) for increasing.

Bold segments (▬) for decreasing.

Leave alone segments where the graph is constant.

2. Below are the equations and domain restrictions for the piecewise function at the right. Put them in order so that it accurately describes the graph. Write the equations on the graph.




EQUATIONS

A. $y = -3$

B. $y = \frac{5}{2}x$

C. $y = 3x - 27$

D. $y = 5$

E. $y = -4x + 19$

Order: B, D, E, A, C

DOMAIN RESTRICTIONS

F. $2 \leq x < 4$

G. $0 \leq x < 2$

H. $8 \leq x \leq 9$

I. $4 \leq x < 6$

J. $6 \leq x < 8$

Order: G, F, I, J, H

3. Sketch an elevation-versus-time graphing story of your own, and then create a story for it.

My Graph:

Answers will vary.

make sure to be precise language when describing graph.

My Story:

4. Suppose two cars are travelling north along a road.

Car 1 travels at a constant speed of 50 mph for two hours, then speeds up and drives at a constant speed of 100 mph for the next hour. The car breaks down and the driver has to stop and work on it for two hours. When he gets it running again, he continues driving recklessly at a constant speed of 100 mph.



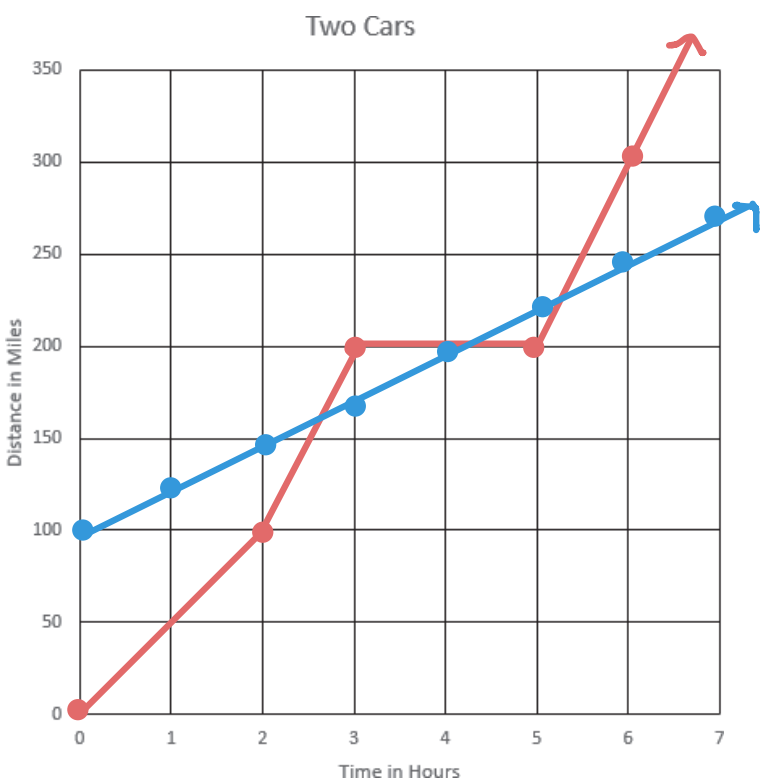

Car 2 starts at the same time that Car 1 starts, but Car 2 starts 100 mi. farther north than Car 1 and travels at a constant speed of 25 mph throughout the trip.

A. Sketch the distance-versus-time graphs for Car 1 and Car 2 on a coordinate plane at the right. Be sure to include a legend.

B. Approximately when do the cars pass each other?

* at 2.5 hours
* at 4 hours
* at 5.25 hours

C. Tell the entire story of the graph from the point of view of Car 2. (What does the driver of Car 2 see along the way and when?)




Answers will vary.

CAR 1

CAR 2

5. **Challenge**

   A. Write linear equations representing each car's distance in terms of time (in hours). Note that you will need four equations for Car 1 and only one for Car 2.

   Car1

   $d = 50t$ $\quad 0 \le t \le 2$

   $d = 100(t-2) + 100$ $\quad 2 < t \le 3$

   $d = 200$ $\quad 3 < t \le 5$

   $d = 100(t-5) + 200$ $\quad t > 5$

   Car 2

   $d = 25t + 100$

   B. Use these equations to find the exact coordinates of when the cars meet.

   First Intersetion:

   $100(t-1) = 25t + 100$

   $\approx (2.7, 166.7)$

   2nd Intersection

   $200 = 25t + 100$

   $(4, 200)$

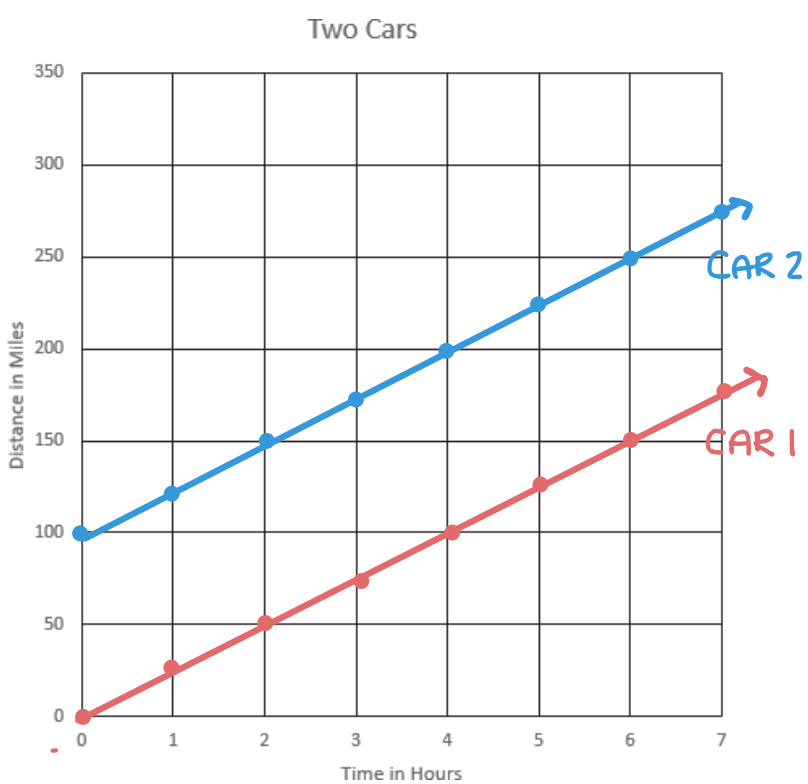
   Third Intersection

   $100(t-3) = 25t + 100$

   $\approx (5.3, 233.3)$

6. Suppose that in Problem 4, Car 1 travels at the constant speed of 25 mph the entire time.

   A. Sketch the distance-versus-time graphs for the two cars on a graph below.




   B. Do the cars ever pass each other? Explain.

   No, both cars are traveling at a constant rate of 25mph

   C. What is the linear equation for Car 1 in this case?

   $d = 25t$

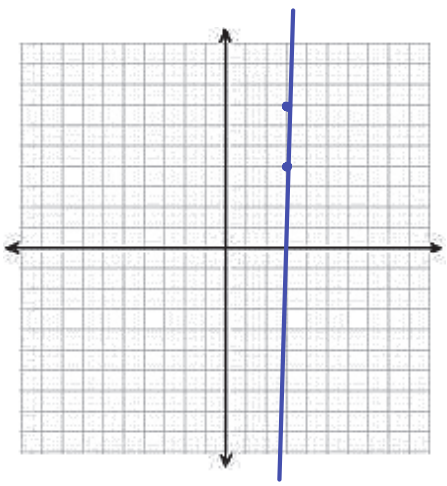
## Spiral REVIEW—Undefined and 0 Slope

7. Find the slope between the two points given.

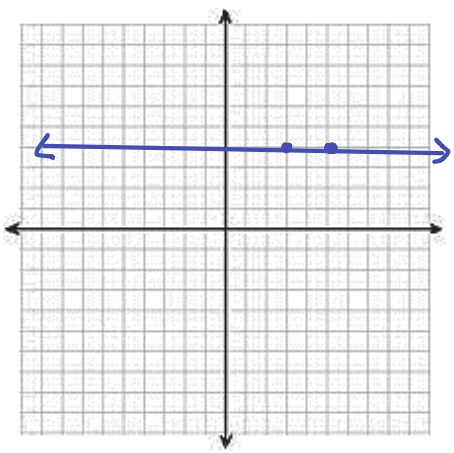
| | |
|---|---|
| A. (0, 3) and (6, 2)<br>$m = -\frac{1}{6}$ | B. (−1, −2) and (4, 0)<br>$m = \frac{2}{5}$ |
| C. (3, 4) and (3, 7)<br>undefined | D. (3, 4) and (5, 4)<br>$m = 0$ |

8. Graph the points from Problem 7C and 7D above. Then connect them to form a line.

7C. (3, 4) and (3, 7)



7D. (3, 4) and (5, 4)



9. How could you describe the lines in Problem 8?

7C → vertical line
$x = 3$
has an undefined slope

7d → horizontal line
$y = 4$
slope is 0.