Calculating Average Rate of Change Name: _____

Read each problem carefully and find the average rate of change (slope). Then, write a sentence interpreting the average rate of change in relationship to the problem. Be sure to include units. For an extra bonus point because you read the directions, draw a star next to your name. Everyone will lose the bonus opportunity if somebody tells somebody else about the bonus opportunity.

Example problem: While typing her English essay, Janet noticed that her clock read 12:32 and the word count of the paper was 568. When she finished the paper, her clock read 12:48 and the final word count was 1128.

x_1 y_1 x_2 y_2 $\frac{y2 - y1}{x2 - x1} = \frac{1128 \text{ words} - (568) \text{ words}}{48 \text{ minutes} - (32) \text{ minutes}} = \frac{560 \text{ words}}{16 \text{ minutes}} =$ 35 words per minute

(32, 568) and (48,1128)

While she wrote her essay from 12:32 – 12:48, she was typing at an average of 35 words per minute.

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1. The population of Austin, TX in 1990 was 472,000 people. The population in 1980 was 346,000 people.

2. At 3 o'clock, Sharon passes mile marker 295 on Highway 35. At 6 o'clock she passes mile marker 475.

3. The value of my new car after 2 years was $11,200. When the car is 6 years old, the value has dropped to $6100.

4. A lab technician is growing a bacteria sample. After one hour, she notes that there are 250 bacteria in a sample. After 3 hours, she notes that there are 1000 bacteria in the sample.

5. Mr. Suarez joined a gym to lose weight. After three weeks of membership, he weighed 189 pounds. When he had been a member for twelve weeks, he weighed only 162 pounds.

6. On his fifth birthday, Paul was 42 inches tall. On his seventh birthday, he was 48 inches tall.

7. In 1984, the price of a VCR was $375. In 1996, the price was $125.

8. Dixie left Memphis with a full tank of gas (16 gallons) and an odometer reading of 12,584 miles. Upon arriving in Nashville, her gas tank was only half full, and her odometer reading was 12,792 miles.

9. Sara works in the Macy's clothing department at the mall. When she began her shift at 4pm, the register showed sales of $1,055. When she clocked out at 9pm, the register showed sales of $4,062.

10. At one o'clock, the temperature outside was 85 degrees. At seven o'clock, the temperature was 61 degrees.

11. When the theme park opened, the counter on the turnstile at the entrance read 1,278. Seven hours later, the counter read 3672.

12. The concession stand at the amusement park begins with 500 popcorn containers. When the park closes, twelve hours later, an inventory shows that there are only 44 containers left.

13. Scott began printing photos at Walgreens at 3:15. At 3:20 he found that it had printed 120 of his 150 photos.

14. The rate at which water flows out of a pipe, in gallons per hour, is given by a continuous function *R* of time *t*. The table shows the rate as measured every 3 hours for a 24-hour period. Between 3 and 12 hour, the water is flowing out of the pipe at a faster and faster rate. Determine the average increase of this rate for the 9 hour period.

t (hours)	0	3	6	9	12	15	18	21	24
R(t) (gallons per hour)	9.6	10.4	10.8	11.2	11.4	11.3	10.7	10.2	9.6

15. The temperature, in degrees Celsius, of the water in a pond is a continuous function *W* of time *t*. The table shows the water temperature as recorded every 3 days over a 15-day period. Based on the 3-day intervals shown in the table, over what 3-day interval is the water temperature increasing most rapidly and how fast is it rising? Over what 3-day interval is the water temperature falling most rapidly and how fast is it dropping?

t (days)	0	3	6	9	12	15
W(t) (Celsius)	20	31	28	24	22	21