NAME _____ DATE _____ PERIOD _____

6-3 Study Guide and Intervention

Rate of Change and Slope

- A rate of change is a rate that describes how one quantity changes in relation to another.
- Slope tells how steep the line is.
- Slope is given by the formula $\frac{\text{change in } y}{\text{change in } x}$ or $\frac{\text{vertical change}}{\text{horizontal change}}$.

Example 1 **Find the rate of change for the table.**

Students	Number of Textbooks
5	15
10	30
15	45
20	60

The change in the number of textbooks is 15 while the change in the number of students is 5.

$\frac{\text{change in number of textbooks}}{\text{change in number of students}} = \frac{15 \text{ textbooks}}{5 \text{ students}}$ The number of textbooks increased by 15 for every 5 students.

$= \frac{3 \text{ textbooks}}{1 \text{ student}}$ Write as a unit rate.

So, the number of textbooks increases by 3 textbooks per student.

Example 2 **The band boosters are selling T-shirts at a linear rate. By 8 P.M., they had sold 25 T-shirts. By 10 P.M., they had sold 45 T-shirts. Find the slope of the line. Explain what the slope represents.**

$\frac{\text{change in number of T-shirts}}{\text{change in time}} = \frac{45 - 25}{10 - 8}$ Definition of slope.

$= \frac{20}{2}$ Simplify.

$= 10$

The slope is 10 and it means that the shirts are selling at a rate of 10 shirts per hour.

Exercises

Find the rate of change for each table.

1.

Side Length	Perimeter
1	4
2	8
3	12
4	16

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2.

Time (in hours)	Distance (in miles)
2	120
4	240
6	360
8	480

Sample answer: 60 miles per hour

3. The temperature at 10 A.M. was 72°F and at 2 P.M. was 88°F. Find the slope of the line. Explain what the slope represents. **4°F per hour; The temperature rose an average of 4°F per hour.**