Algebra 2 (Honors)

Section 1.2: Slopes and Intercepts

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Objectives**: Students will be able to write an equation in slope-intercept form, given two points on the line or the slope and a point on the line.

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| **Main Idea** | **Notes** |
| **Do Now: Graphing Calculator Exploration**  **Do Now: Graphing Calculator Exploration (Continued)**  **Vocabulary: Slope** | 1. Graph the linear equation y = x. 2. Use the trace feature to find the coordinates of any 2 points, on the line. 3. Find the *quotient* . 4. Let’s compare *quotients* with your classmates. 5. How is the result related to the x-coefficient in the linear equation you graphed? 6. Write anything you can conclude from this. 7. Graph the linear equation y = -3x + 2. 8. Use the trace feature to find the coordinates of any 2 points, on the line. 9. Find the *quotient* . 10. How is the result related to the x-coefficient in the linear equation you graphed? 11. Predict the *quotient* that you will get from y = 5x + 3. Check your prediction. Are you correct? 12. Describe the relationship between the x-coefficient in the linear equations and the steepness of their graphs.   The slope (gradient, incline, pitch) is used to describe the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  The slope is also known as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |
| **Example 1: Wheelchair Ramp**  **Example 2: Determine the Average Rate of Change**  **Example 2: Determine the Average Rate of Change (Continued)**  **Vocabulary: Slope Formula**  **Example 3: Finding the Slope Using Two Points**  **Graphing Calculator Exploration:** | The steepness of wheelchair ramps is of great importance for safety.    Average rate of change of any wheelchair ramp = 1/12.  If the rise is 1.5 m, what is the run?  Determine the average rate of change of the roof.    Determine the average rate of change of each staircase.    Slope is a ratio and can be expressed as:  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Slope formula:  Note: The order of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is important. You must form the  numerator and denominator using the same \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  Incorrect:  Calculate the slope between (-3, 6) and (5, 2)   1. Graph the equations: y = 3, y = 5, y = , and y = -3. 2. How are all the graphs alike? 3. Find the slope of each line. Are any of the slopes the same? 4. Predict the slope of the line y = 4. Check using a graph. Were you correct? 5. Make a generalization about the slopes of horizontal lines. |
| **Vocabulary: Types of Slopes**  **Graphing on Paper Exploration:** | Horizontal lines have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ slope.  Draw a picture below:   1. Graph the equations: x = 3, x = 5, x = , and x = -3. 2. How are all the graphs alike? 3. What can you say about the slope of each line? 4. Predict the slope of the line x = -4. Check using a graph. Were you correct? 5. Make a generalization about the slopes of vertical lines. |
| **Vocabulary: Types of Slopes** | Vertical lines have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  Draw a picture below: |
| **Your Turn** | Directions: What is the slope of the line that passes through the given points?   1. (4, 12) and (-2, -3) 2. (7, 5) and (17, 5) 3. (-2, -6) and (-2, 8) 4. Does it matter if you do or ? |
| **Vocabulary: Slope-Intercept Form** | Write and label all the parts of Slope-Intercept Form below:  Example: Write the linear equation with a slope of 3 and a y-intercept of 4.  Note: Just by looking at an equation in this form, we can draw the line (no tables) |
| **Example 4: Finding the Slope and Y-Intercept**  **Example 5: Graph the Linear Equation** | Write the slope and y-intercept for each of the equations:   1. y = 2x +1 b) y = –x – 4 c) y = 3/2 x – 2     Graph y = 2x +1. Fill in the steps as you graph.  Step 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Step 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  http://media3.picsearch.com/is?ld6f5QUxmFiM3ZRyqIFrmGPka0WX-7aRwTTzRelaua0&height=318 |
| **Example 6: Lines used for Estimation** | The cash flow per share for Verizon was $2.38 in 1998 and $2.80 in 1999.   1. Write a linear equation that gives the cash flow per share in terms of the year. 2. Predict the cash flow in 2002. |
| **Exit Ticket:** | Suppose (-1, 7), (0, 4), and (2, -2) are all points on one line.  Is the slope of the line the same no matter which two points you use to find the slope? Why or why not? |
| **Homework:** |  |