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 = $\frac{2}{3}$x.
2. Use the trace feature to find the coordinates of any 2 points, $P\_{1}\left(x\_{1},y\_{1}\right)and P\_{2}\left(x\_{2},y\_{2}\right) $on the line.
3. Find the *quotient* $\frac{y\_{2}-y\_{1}}{x\_{2}-x\_{1}}$.
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, $P\_{1}\left(x\_{1},y\_{1}\right)and P\_{2}\left(x\_{2},y\_{2}\right) $on the line.
9. Find the *quotient* $\frac{y\_{2}-y\_{1}}{x\_{2}-x\_{1}}$.
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 = $\frac{2}{3}$, 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.
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| **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 = $\frac{2}{3}$, 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.
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| **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 $\frac{y\_{2}-y\_{1}}{x\_{2}-x\_{1}}$ or $\frac{y\_{1}-y\_{2}}{x\_{1}-x\_{2}}$ ?
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| **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.
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| **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:**  |  |