Week of Tuesday November 13th - Thursday, November 15th Guided Notes: Functions & Slope

**> Do Now:**

1. Identify the x and y coordinates for the ordered pair: (-5, 7)
2. Where is the x-axis – horizontal or vertical?
3. Where is the y-axis – horizontal or vertical?
4. Write anything you know about slope.

**>Functions**

* **Function:** A relationship between an **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**
  + Most functions correspond to a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
  + Each time you **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**
* **Linear Function:** A function that is a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**
  + When you think of functions as a machine, there is always something you put in to get your product.
  + Think of what youput in as the INPUT. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**
  + Think of what you get out of the machine as the OUTPUT. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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* The definition of a function states that each x value has exactly 1 y value.
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**> Example Problems: Function or Not?**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | **X Value** | **Y Value** | | -2 | -4 | | -1 | -2 | | 0 | 0 | | 1 | 2 | | 2 | 4 |   1) | |  |  | | --- | --- | | **X Value** | **Y Value** | | Brandon | Blue | | Josh | Green | | Dasha | Blue | | Khylee | Purple | | Darius | Green |   2) |
| 3)   |  |  | | --- | --- | | **X Value** | **Y Value** | | 1 | -7 | | 2 | -3 | | 3 | 5 | | 4 | 7 | | 5 | -3 | | 4)   |  |  | | --- | --- | | **X Value** | **Y Value** | | -10 | 10 | | -2 | 2 | | -1 | 1 | | 10 | 10 | | 2 | 2 | |
| |  |  | | --- | --- | | **X Value** | **Y Value** | | 0 | 5 | | 1 | 5 | | 2 | 5 | | 3 | 5 | | 0 | 5 |   5) | |  |  | | --- | --- | | **X Value** | **Y Value** | | -3 | 3 | | -3 | 5 | | -2 | 2 | | -2 | -2 | | -1 | 5 |   6) |
| |  |  | | --- | --- | | **X Value** | **Y Value** | | -2 | 1 | | -3 | 1 | | -1 | 6 | | 4 | 5 | | -3 | 1 |   7) | |  |  | | --- | --- | | **X Value** | **Y Value** | | -2 | 3 | | -2 | 4 | | -1 | 5 | | 0 | 6 | | 1 | 7 |   8) |
| 9) Does the following represent a function?  { (-9,8), (10,12), (9, 7), (8,7), (-5,3), (4, 3) } | 10) Does the following represent a function?  { (5,7), (6,7), (8, 7), (9,7), (10,7), (11, 7) } |
| 11) Does the following represent a function?  { (-3,4), (-4,5), (-4, 4), (-5, 5), (-6,7), (-7, 7) } | 12) Does the following represent a function?  { (2,5), (3,6), (4, 3), (5, 5), (6,7), (7, 7) } |
| 13) Does the following represent a function?  { (8,7), (9,6), (4, 3), (2, 5), (10,7), (-7, 7) } | 14) Does the following represent a function?  { (3,7), (7,6), (2, 3), (1, 5), (10,7), (-7, 7) } |
| 15) Does the following represent a function?  { (5,7), (7,6), (12, 3), (26, 8), (8,26), (-7, 12) } | 16) What coordinate could be added to the group to make it a function?  { (-5,3), (6, 7), (10, 12), (8, 2) }   1. (-3, 7) 2. (6, 4) 3. (-5, 7) 4. (6, 8) |
| 17) What coordinate could be added to the group to make it a function?  { (8,12), (-6, 15), (6, 15,), (6, 42) }   1. (8, 12) 2. (-6, 7) 3. (6, 4) 4. (6, 8) | 18) What coordinate could be added to the group to make it a function?  { (9,13), (4, 1), (2, 6), (8, 2) }   1. (8, 12) 2. ( 7, 5) 3. (2, 1) 4. (8, 8) |
| 19) What coordinate could be added to the group to make it a function?  { (7, 10), (-4, 5), (8, 6), (14, 3) }   1. (8, 12) 2. ( 7, 5) 3. (2, 1) 4. (8, 8) | 20) What coordinate could be added to the group to make it a function?  { (14, 6), (3, 8), (2, 9), (11, 5) }   1. (6, 8) 2. ( 3, 5) 3. (2, 1) 4. (14, 8) |

**>Functions: The Vertical Line Test**

* We said a function can only have 1 y value for each x value, therefore, if we look at a graph and more than one y value corresponds to an x value, the graph is not a function.
* The vertical line test states: if you draw a vertical line (up and down) through the graph and it

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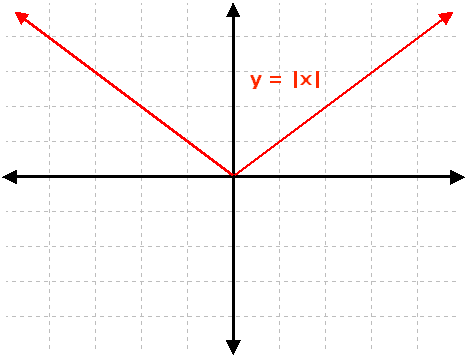
**>Vertical Line Test Examples: Are the graphs functions? Yes or No.**

|  |  |
| --- | --- |
| 21) | 22) |
| 23) | 24) |
| 25) | 26) |

**Wednesday, November 14th**

|  |  |
| --- | --- |
| **X** | **Y** |
| -2 | -4 |
| 0 | 0 |
| 2 | 4 |
| 4 | 8 |

**> Do Now:**

1. Is the table to the right a function?
2. Write a definition of a function.
3. Is the graph to the right a function?
4. Create a set of coordinates that represent a function.

**>Slope**

* **Slope:** A number that shows how much the\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Often referred to as **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* Slope (m) is determined by calculating **the change in (Δ) two y values divided by the change in (Δ) two x values.**

**y2 – y1 = Δy = rise  
x2 – x1 Δx run**

**Examples:**

|  |
| --- |
| 1) What is the slope of a line that passes through (2, -5) and (6, -2)?  \*Remember\*: slope is the Δy divided by the Δx.   * y2 – y1 = (-2 - -5) = 3 = 0.75   x2 – x1 (6 – 2) 4   * It doesn’t matter if you do y2 – y1 or y1 – y2, just as long as you use the same order of x coordinates. * **Look at this to understand:** * y1 – y2 = (-5 - -2) = -3 = 0.75   x1 – x2 (2 – 6) -4 |
| |  |  | | --- | --- | | **x** | **y** | | -1 | 1 | | 0 | 3 | | 1 | 5 |   2) The table shows the coordinates of three points contained in the graph of a line.  What is the slope of the line? |
| 3) What is the slope of the line that passes through the points (6, 13) and (10, 21)? |
| 4) What is the slope of the line that passes through (-4, 2) and (6, -4)? |
| 5) What is the slope of a line that passes through (-4, 2) and (0, 0)? |
| 6) What is the slope of a line that passes through (7, 5) and (1, 3)? |
| |  |  | | --- | --- | | **x** | **y** | | -6 | -4 | | 0 | -2 | | 6 | 0 |   7) The table shows the coordinates of three points contained in the graph of a line.  What is the slope of the line? |
| |  |  | | --- | --- | | **x** | **y** | | 7 | 8 | | 10 | 9 | | 13 | 15 |   8) The table shows the coordinates of three points contained in the graph of a line.  What is the slope of the line? |
| |  |  | | --- | --- | | **x** | **y** | | 5 | -4 | | 9 | 7 | | 14 | -12 |   9) The table shows the coordinates of three points contained in the graph of a line.  What is the slope of the line? |
| 10) What is the slope of the line that passes through the points (8, 15) and (8, 19)? |
| |  |  | | --- | --- | | **x** | **y** | | 7 | 10 | | 2 | 9 | | 1 | 6 |   11) The table shows the coordinates of three points contained in the graph of a line.  What is the slope of the line? |
| 12) What is the slope of the line that passes through the points (10, 6) and (7, 4)? |

**Thursday, November 15th**

|  |  |
| --- | --- |
| **x** | **y** |
| 12 | 7 |
| 14 | 5 |
| 15 | -3 |

**> Do Now:**

1. What is the slope of a line that passes through the points (3,12), and (10, 2)?
2. What is the slope of the line with the points given in the table to the right?

>Determining Slope From A Graph:

* In order to determine the slope of a graph, you must determine what the rise is and put it over whatever the run is.

1. **Pick 2 points on the graph.** 
   * Pick points where the line is on the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
2. **Determine the rise by going up on the graph until you reach the level of your next point.** 
   * **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or your rise.**
3. **Determine the run by going left or right on the graph until you reach the next point.**
   * **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or your run.**
4. **Put your rise over your run and that is your slope.**

**>Examples:**

|  |  |
| --- | --- |
| 32.tiff1) Determine the slope of the line graphed below. | 2) Determine the slope of the line graphed below.  33.tiff |
| 3) Determine the slope of the line graphed below.  **34.tiff** | 35.tiff4) Determine the slope of the line graphed below. |
| 5) Determine the slope of the line graphed below. 36.tiff | 6) Determine the slope of the line graphed below.  C:\Users\IT\AppData\Local\Temp\graph_20111113_133247.png |
| 7) Determine the slope of the line graphed below.  C:\Users\IT\AppData\Local\Temp\graph_20111113_133524.png | 8) Determine the slope of the line graphed below.  C:\Users\IT\AppData\Local\Temp\graph_20111113_135115.png |
| 9) Determine the slope of the line graphed below.  C:\Users\IT\AppData\Local\Temp\graph_20111113_135856.png | 10) Determine the slope of the line graphed below.  C:\Users\IT\AppData\Local\Temp\graph_20111113_140134.png |
| 11) Determine the slope of the line graphed below.  C:\Users\IT\AppData\Local\Temp\graph_20111113_140459.png | 12) Determine the slope of the line graphed below.  C:\Users\IT\AppData\Local\Temp\graph_20111113_140934.png |
| 13) Determine the slope of the line graphed below.  C:\Users\IT\AppData\Local\Temp\graph_20111113_141228.png | 14) Determine the slope of the line graphed below.  C:\Users\IT\AppData\Local\Temp\graph_20111113_141548.png |
| 15) Determine the slope of the line graphed below.  C:\Users\IT\AppData\Local\Temp\graph_20111113_142454.png | 16) What is the slope of a line that passes through (-10, 5), (20, 10)? |
| 17) What is the slope of the line given the table?   |  |  | | --- | --- | | **X** | **y** | | 5 | 12 | | 7 | 15 | | 9 | 20 | |  |