**The Picture Tells the (*Linear*) Story**

Complete the table for each equation below. Then graph the equation on the axes provided. Finally, answer the questions that follow.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. y = x   |  |  | | --- | --- | | x | y | | −8 |  | | −4 |  | | 0 |  | | 4 |  | | 8 |  |   [image] | 2. y = −x   |  |  | | --- | --- | | x | y | | −8 |  | | −4 |  | | 0 |  | | 4 |  | | 8 |  |   [image] |

* How are the lines alike?
* How are they different?

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3. y =2 x   |  |  | | --- | --- | | x | y | | −4 |  | | −2 |  | | 0 |  | | 2 |  | | 4 |  |   [image] | 4. y = 3x   |  |  | | --- | --- | | x | y | | −3 |  | | −2 |  | | 0 |  | | 2 |  | | 3 |  |   [image] | 5. y = 5x   |  |  | | --- | --- | | x | y | | −2 |  | | −1 |  | | 0 |  | | 1 |  | | 2 |  |   [image] |
| 6. y =   |  |  | | --- | --- | | x | y | | −8 |  | | −4 |  | | 0 |  | | 4 |  | | 8 |  |   [image] | 7. y =   |  |  | | --- | --- | | x | y | | −9 |  | | −3 |  | | 0 |  | | 3 |  | | 9 |  |   [image] | 8. y =   |  |  | | --- | --- | | x | y | | −8 |  | | −4 |  | | 0 |  | | 4 |  | | 8 |  |   [image] |

**Refer to your graphs to answer the following questions:**

* Describe the differences in the graphs.
* Which appears the steepest?
* Which appears flattest?
* What makes the difference?
* How is the equation of the line related to the graph of the line?
* When looking at the equation of the line, how can you determine if the graph will slant up from left to right without graphing the line?
* When looking at the equation of the line, how can you determine if the graph will slant down from left to right without graphing the line?
* Which of the following lines is the steepest?

y = ½ x y = 4x y = x y = 2x

Why?