Slope

❖ The **slope (m)** of a line is the <u>ratio</u> of the change in y-values (rise) to the change in x-values (run).

❖ The **slope** of the line is also called the **average rate of change**

$$\mathbf{m = slope = \frac{rise}{run} = \frac{\textit{Change in output values}}{\textit{Change in input values}}}$$

- **POSITIVE SLOPES**
  Lines that have a positive slope go **up** and to the **right**.

- **NEGATIVE SLOPES**

  Lines that have a negative slope go **down** and to the **right**.

- **HORIZONTAL LINES**
  All horizontal lines have a **zero** slope. (Change in y is zero)
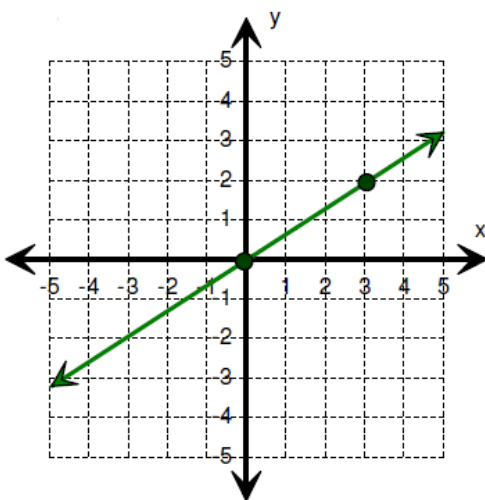
- **VERTICAL LINES**
  All vertical lines have an **undefined slope or no slope**.

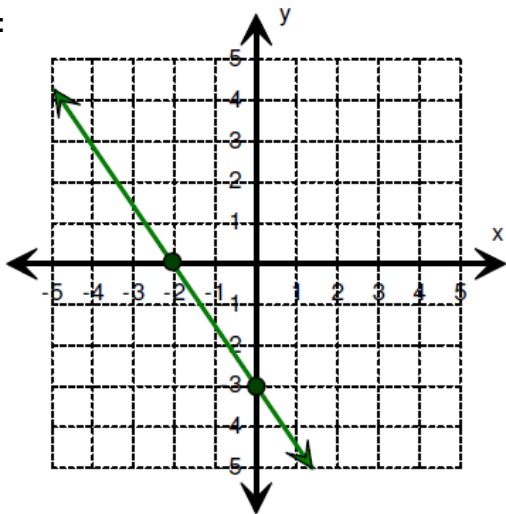 (Change in x is zero: zero is in denominator)

Positive Slope Increasing	Negative Slope Decreasing
Zero Slope Horizontal Line	Undefined Slope Vertical Line

Example 1: Find the slope of each of the following lines.

How To: Determine how many units you go up/down from one point to the next and then over to the right.
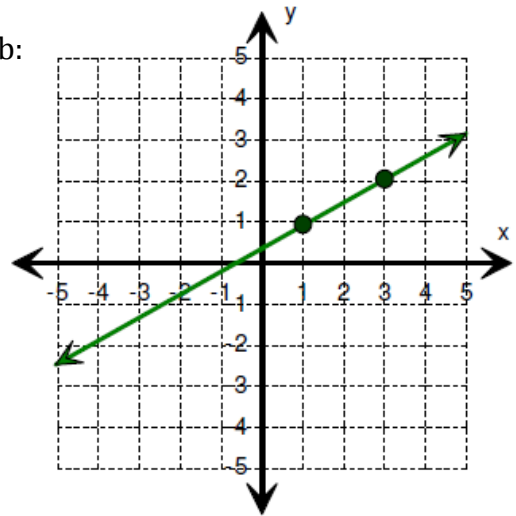
Example 2: Find the slope of each of the following lines.
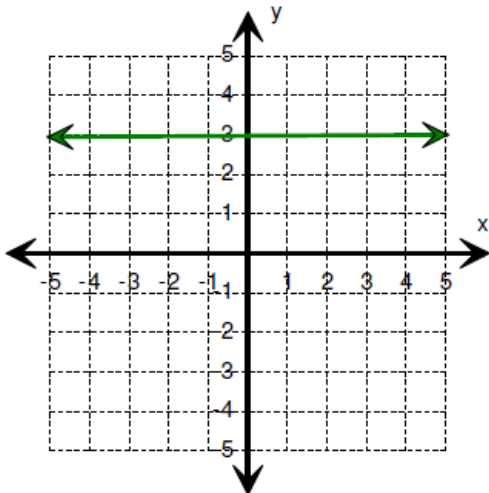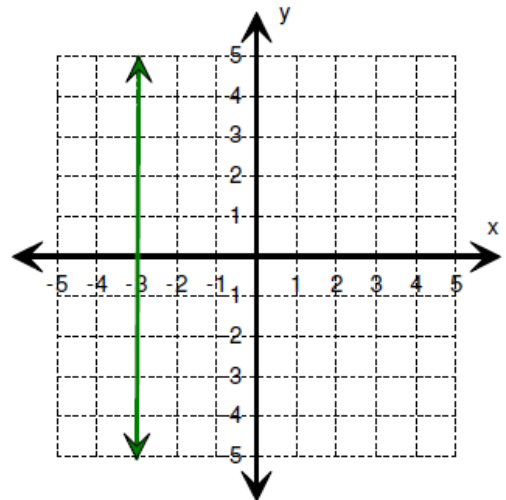
a:

b:

Example 3: Find the slope of the line.

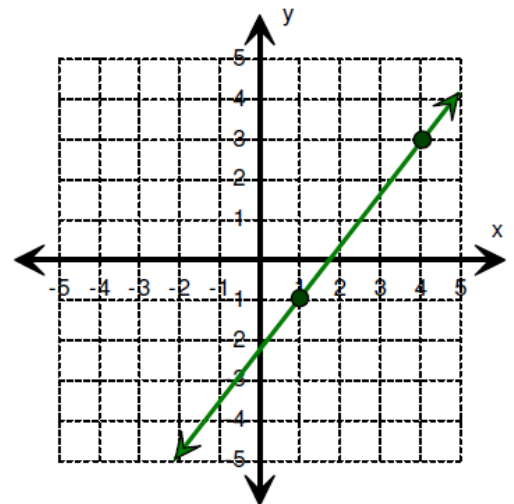**Example 4**: Find the slope of the line.

Example 5:

a: Identify the type of slope (positive, negative, undefined (no slope) or zero)
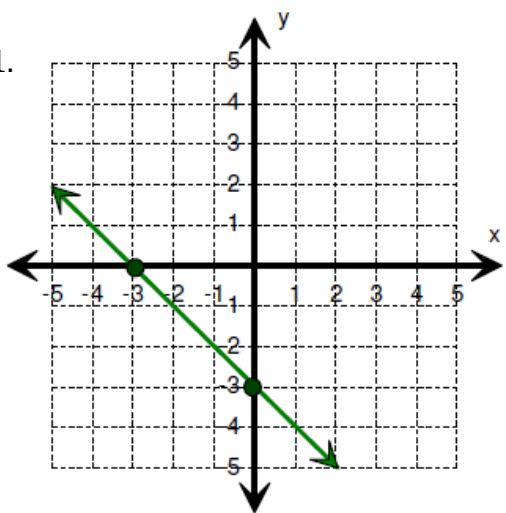
b: What is the slope of the line?

c: Is the line a function?

On Your Own!

a: Identify the type of slope (positive, negative, undefined (no slope) or zero).
b: What is the slope of the line?
c: Is the line a function?
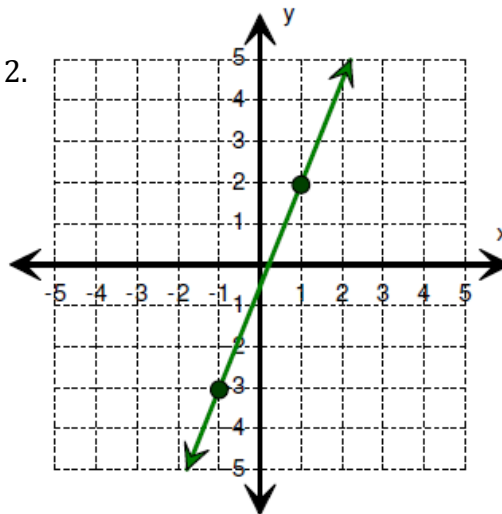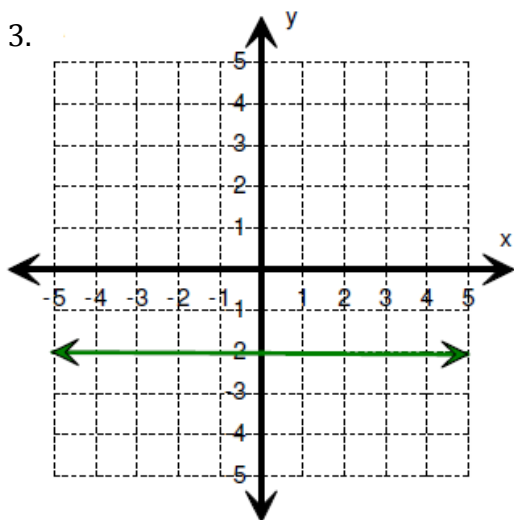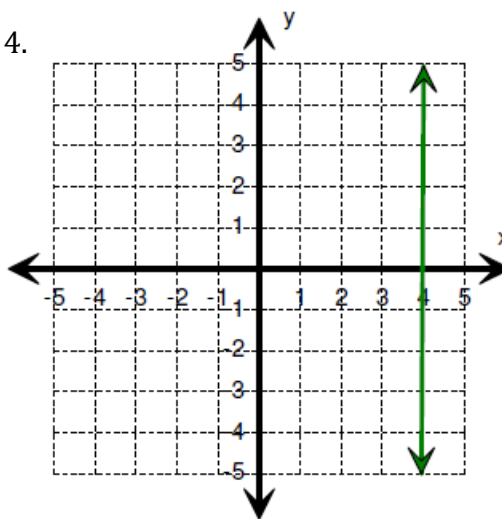
1.

a: _____

b: _____

c: _____

2.

a: _____

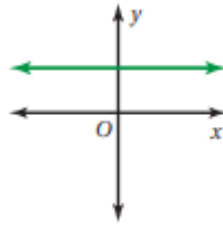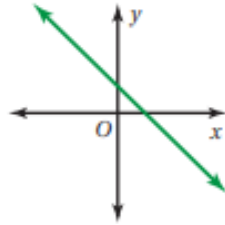b: _____

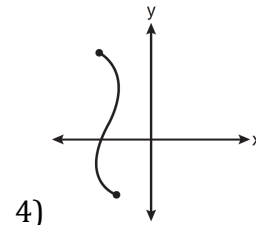c: _____

3.

a: _____

b: _____

c: _____

4.

a: _____

b: _____

c: _____

5. Fill in the types of slopes using the graphs below; *positive, negative, undefined, zero.*

_____   _____   _____   _____
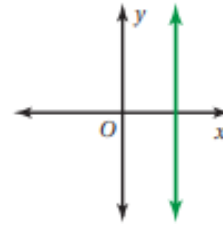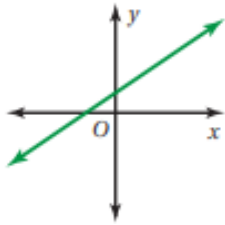
6. Which graph does *not* represent a function?

1)   2)   3)   4)
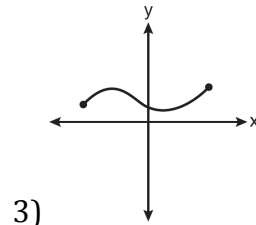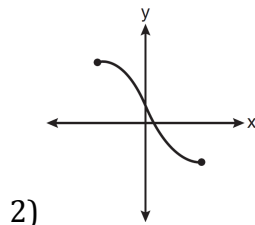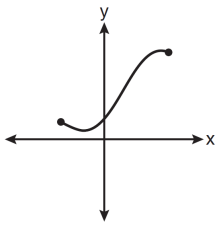
7. Given the relation $R = \{(-2, 3), (a, 4), (1, 9), (0, 7)\}$. Which replacement for a makes this relation a function?

1)   1
2)   -2
3)   0
4)   3