

Write and solve for y:

$$x + 0.5y = 1.5$$

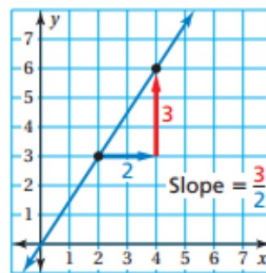
## 4~2 Slope

### Vocabulary

### Vocabulary meaning...

#### Slope

Rate of change between any 2 points on a line

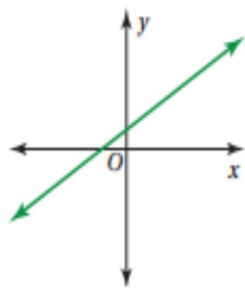


To find the slope of a line, find the ratio of the **change in y** (vertical change) to the **change in x** (horizontal change).

$$\text{slope} = \frac{\text{change in } y}{\text{change in } x}$$

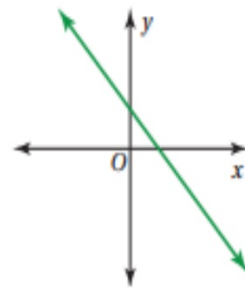
## Positive vs Negative Slopes

### *Positive Slope*



The line rises from left to right.

### *Negative Slope*



The line falls from left to right.

## Real life application



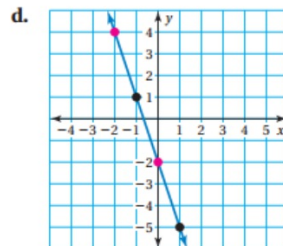
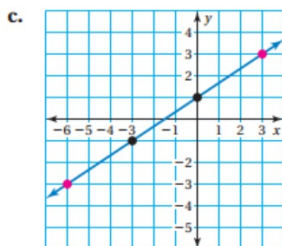
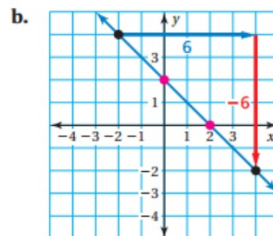
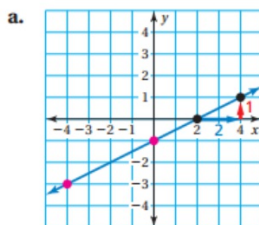
What is the slope?

## Activity understanding SLOPE

Method 1: Use the two black points. ●

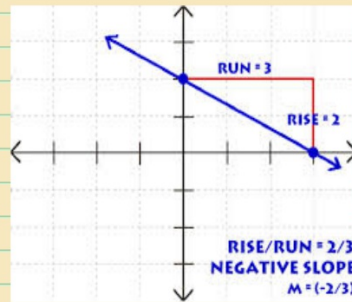
Method 2: Use the two pink points. ●

Do you get the same slope using each method? Why do you think this happens?



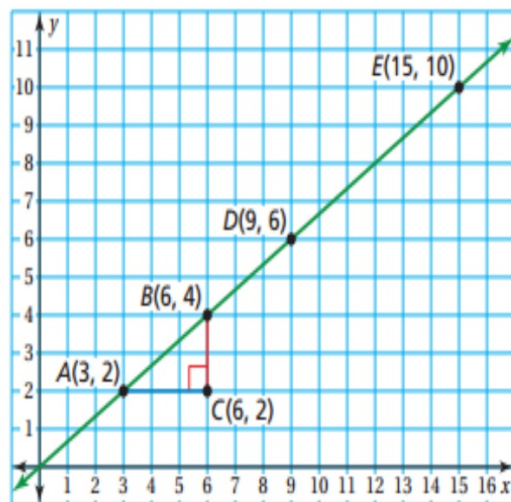
**Example 2**  
**Finding slope**  
**Steps**

**Solve**



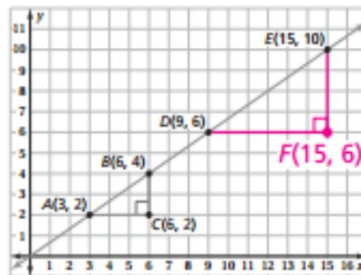
**Work with a partner. Use the figure shown.**

- $\triangle ABC$  is a right triangle formed by drawing a horizontal line segment from point  $A$  and a vertical line segment from point  $B$ . Use this method to draw another right triangle,  $\triangle DEF$ .
- What can you conclude about  $\triangle ABC$  and  $\triangle DEF$ ? Justify your conclusion.
- For each triangle, find the ratio of the length of the vertical side to the length of the horizontal side. What do these ratios represent?
- What can you conclude about the slope between any two points on the line?



Work with a partner. Use the figure shown.

- a.  $\triangle ABC$  is a right triangle formed by drawing a horizontal line segment from point  $A$  and a vertical line segment from point  $B$ . Use this method to draw another right triangle,  $\triangle DEF$ .



- b. What can you conclude about  $\triangle ABC$  and  $\triangle DEF$ ? Justify your conclusion.

**They are similar.**

- c. For each triangle, find the ratio of the length of the vertical side to the length of the horizontal side. What do these ratios represent?

**$\frac{2}{3}$ ; the slope of the line between points  $A$  and  $B$  and between points  $D$  and  $E$**

- d. What can you conclude about the slope between any two points on the line?

**Sample answer: It is constant.**



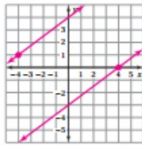
**Work with a partner.**

- a. Draw two lines with slope  $\frac{3}{4}$ . One line passes through  $(-4, 1)$ , and the other line passes through  $(4, 0)$ . What do you notice about the two lines?
- b. Draw two lines with slope  $-\frac{4}{3}$ . One line passes through  $(2, 1)$ , and the other line passes through  $(-1, -1)$ . What do you notice about the two lines?
- c. **CONJECTURE** Make a conjecture about two different nonvertical lines in the same plane that have the same slope.
- d. Graph one line from part (a) and one line from part (b) in the same coordinate plane. Describe the angle formed by the two lines. What do you notice about the product of the slopes of the two lines?
- e. **REPEATED REASONING** Repeat part (d) for the two lines you did *not* choose. Based on your results, make a conjecture about two lines in the same plane whose slopes have a product of  $-1$ .

Work with a partner.

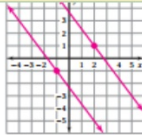
- a. Draw two lines with slope  $\frac{3}{4}$ . One line passes through  $(-4, 1)$ , and the other line passes through  $(4, 0)$ . What do you notice about the two lines?

**The two lines are parallel.**



- b. Draw two lines with slope  $-\frac{4}{3}$ . One line passes through  $(2, 1)$ , and the other line passes through  $(-1, -1)$ . What do you notice about the two lines?

**The two lines are parallel.**

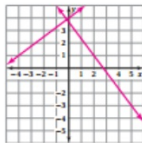


- c. **CONJECTURE** Make a conjecture about two different nonvertical lines in the same plane that have the same slope.

**They are parallel.**

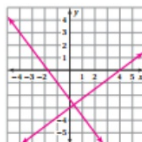
- d. Graph one line from part (a) and one line from part (b) in the same coordinate plane. Describe the angle formed by the two lines. What do you notice about the product of the slopes of the two lines?

**The two lines form a right angle. The product is  $-1$ .**



- e. **REPEATED REASONING** Repeat part (d) for the two lines you did *not* choose. Based on your results, make a conjecture about two lines in the same plane whose slopes have a product of  $-1$ .

**They are perpendicular.**



What To Your Answer?

## Example 1

### Finding the slope of a line

Describe the slope of the line. Then find the slope.

