

Slope = Rate of Change = $\frac{\Delta y}{\Delta x}$

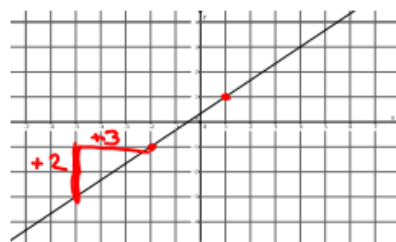
Lesson 15: The Slope of a Non-Vertical Line

Classwork

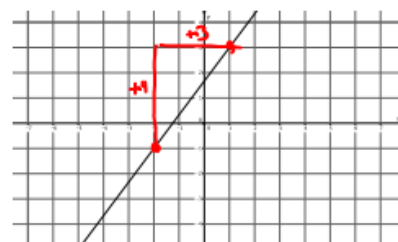
Opening Exercise

Example:

Graph A



Graph B



a. Which graph is steeper?

Graph B

b. Write directions that explain how to move from one point on the graph to the other for both Graph A and Graph B.

We move up 2 right

c. Write the directions from part (b) as ratios, and then compare the ratios. How does this relate to which graph was steeper in part (a)?

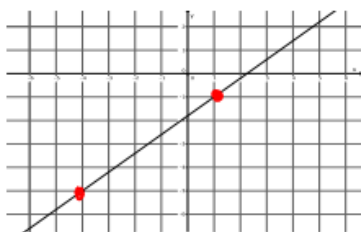
Graph A
 $\frac{\Delta y}{\Delta x} = \frac{\text{up } 2}{\text{right } 3} = \frac{2}{3}$

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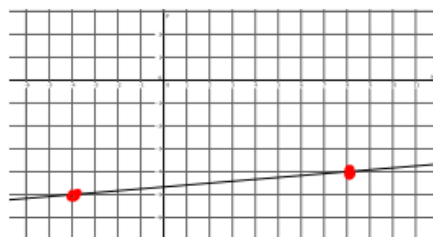
Graph B
 $\frac{\Delta y}{\Delta x} = \frac{\text{up } 4}{\text{right } 3} = \frac{4}{3}$

Steeper means it has a greater slope

Pair 1:
Graph A



Graph B



a. Which graph is steeper?

Graph. A

b. Write directions that explain how to move from one point on the graph to the other for both Graph A and Graph B.

We move up and right

c. Write the directions from part (b) as ratios, and then compare the ratios. How does this relate to which graph was steeper in part (a)?

Graph A

$$\frac{4}{5}$$

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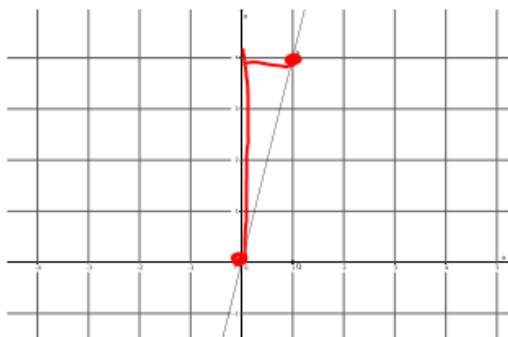
Graph B

$$\frac{1}{12}$$

Exercises

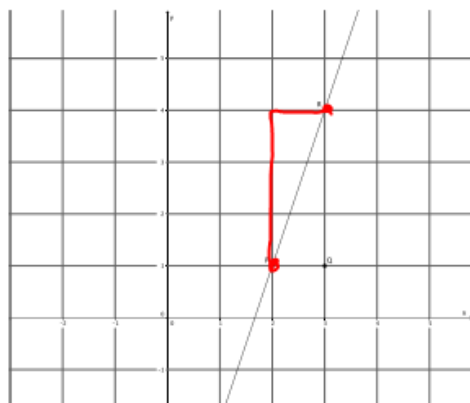
Use your transparency to find the slope of each line if needed.

1. What is the slope of this non-vertical line?



$$m = \frac{\Delta y}{\Delta x} = \frac{4}{1} = 4$$

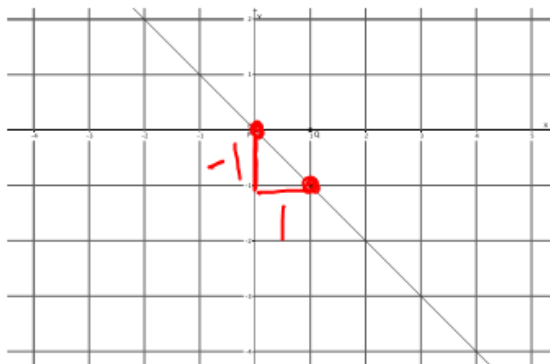
2. What is the slope of this non-vertical line?



$$m = \frac{\Delta y}{\Delta x} = \frac{3}{1} = 3$$

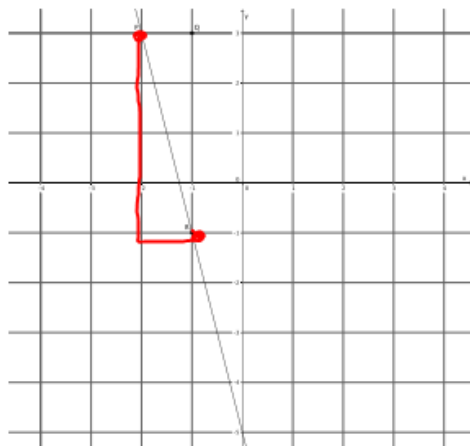
3. Which of the lines in Exercises 1 and 2 is steeper? Compare the slopes of each of the lines. Is there a relationship between steepness and slope?

4. What is the slope of this non-vertical line?



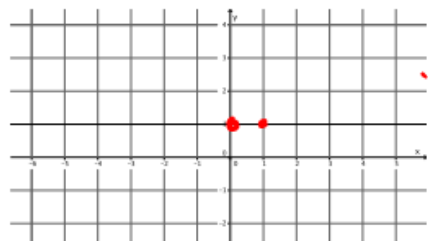
$$m = \frac{\Delta y}{\Delta x} = \frac{-1}{1} = -1$$

5. What is the slope of this non-vertical line?



$$m = \frac{\Delta y}{\Delta x} = \frac{-4}{1} = -4$$

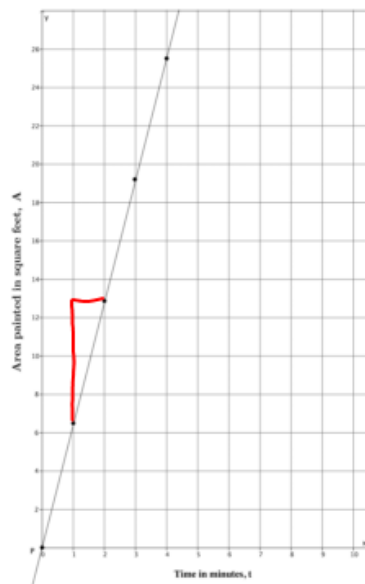
6. What is the slope of this non-vertical line?



$$m = \frac{\Delta y}{\Delta x} = \frac{0}{1} = 0$$

16. Emily paints at a constant rate. She can paint 32 square feet in five minutes.

t (time in minutes)	Linear equation: $A = \frac{32}{5}t$	A (area painted in square feet)
0	$A = \frac{32}{5}(0)$	0
1	$A = \frac{32}{5}(1)$	$\frac{32}{5} = 6.4$
2	$A = \frac{32}{5}(2)$	$\frac{64}{5} = 12.8$
3	$A = \frac{32}{5}(3)$	$\frac{96}{5} = 19.2$
4	$A = \frac{32}{5}(4)$	$\frac{128}{5} = 25.6$



- How many square feet can Emily paint in one minute? In other words, what is her unit rate of painting?
- Assume that the graph of the situation is a line, as shown in the graph. What is the slope of the line?

17. A copy machine makes copies at a constant rate. The machine can make 80 copies in $2\frac{1}{2}$ minutes.

t (time in minutes)	Linear equation: $n = 32t$	n (number of copies)
0	$n = 32(0)$	0
0.25	$n = 32(0.25)$	8
0.5	$n = 32(0.5)$	16
0.75	$n = 32(0.75)$	24
1	$n = 32(1)$	32

- How many copies can the machine make each minute? In other words, what is the unit rate of the copy machine?
- Assume that the graph of the situation is a line, as shown in the graph. What is the slope of the line?

