

## Unit 4 – Lesson 15

Name: \_\_\_\_\_

## The Slope of a Non-Vertical Line

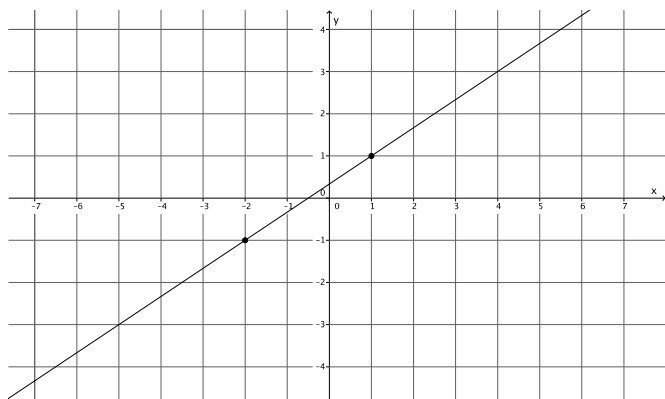
Date: \_\_\_\_\_ Period: \_\_\_\_\_

<b>Focus Standards:</b>	8.EE.B.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. <i>For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.</i>
	8.EE.B.6	Use similar triangles to explain why the slope $m$ is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation for a line through the origin and the equation for a line intercepting the vertical axis at .

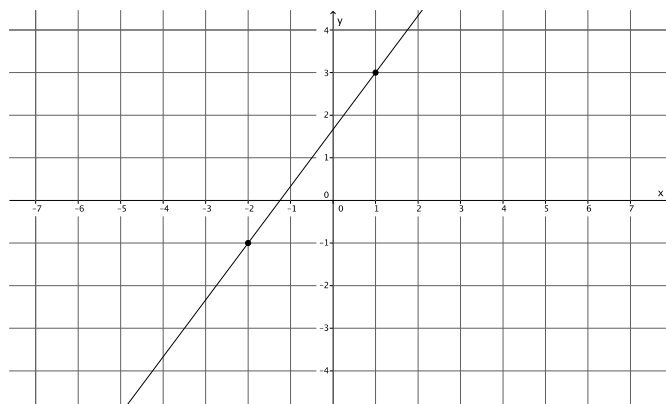
## Student Outcomes

- Students know slope is a number that describes the steepness or slant of a line.
- Students interpret the unit rate as the slope of a graph.

Graph A

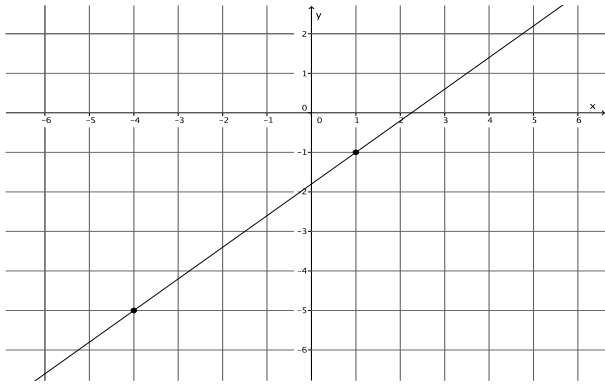


Graph B

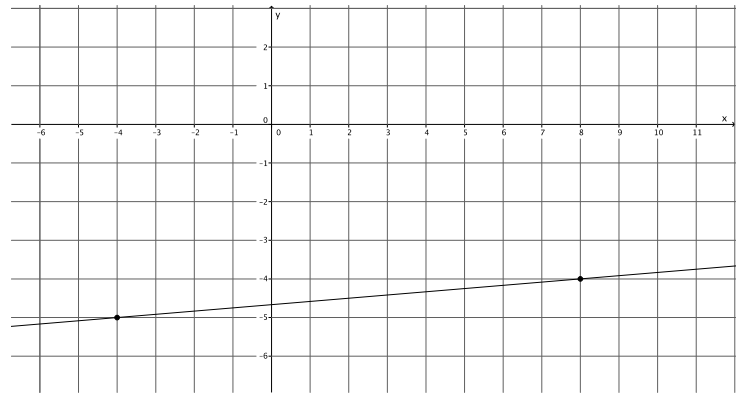


- Which graph is steeper?
- Write directions that explain how to move from one point on the graph to the other for both Graph A and Graph B.
- Write the directions from part (b) as ratios, and then compare the ratios. How does this relate to which graph was steeper in part (a)?

**Pair 1:**  
**Graph A**



**Graph B**

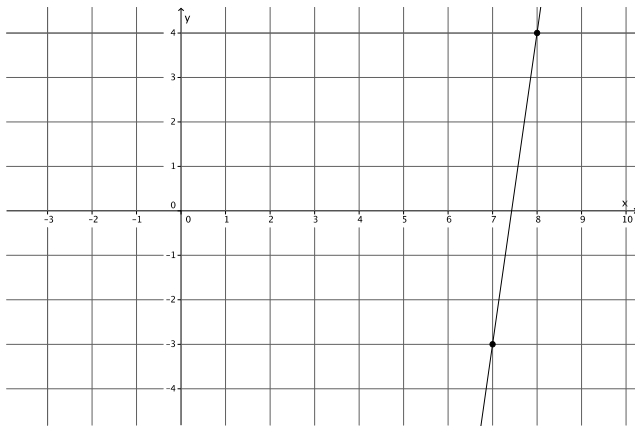


- Which graph is steeper?
- Write directions that explain how to move from one point on the graph to the other for both Graph A and Graph B.
- Write the directions from part (b) as ratios, and then compare the ratios. How does this relate to which graph was steeper in part (a)?

**Pair 2:**

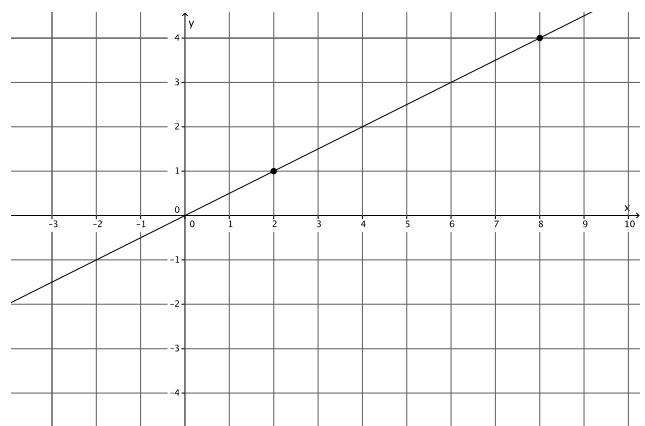
**Graph**

**A**



**Graph**

**B**

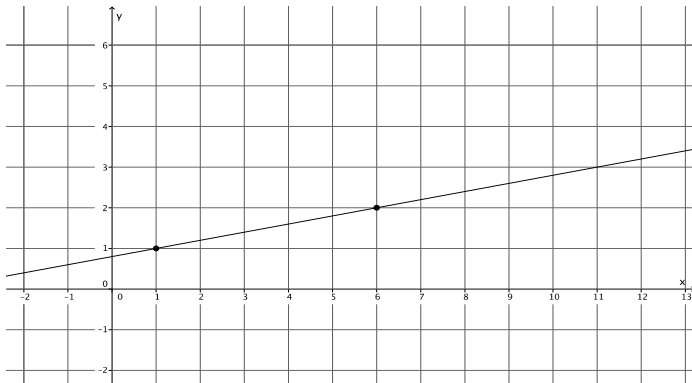


d. Which graph is steeper?

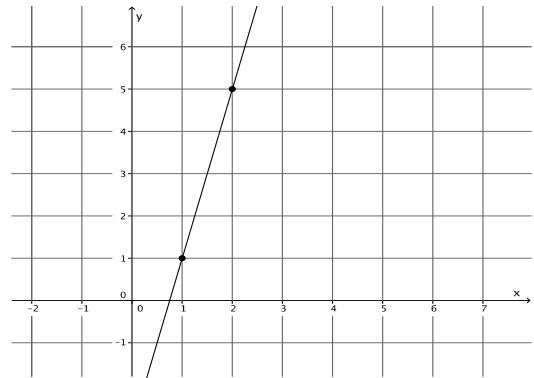
e. Write directions that explain how to move from one point on the graph to the other for both Graph A and Graph B.

f. 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)?

**Pair 3:**  
**Graph A**



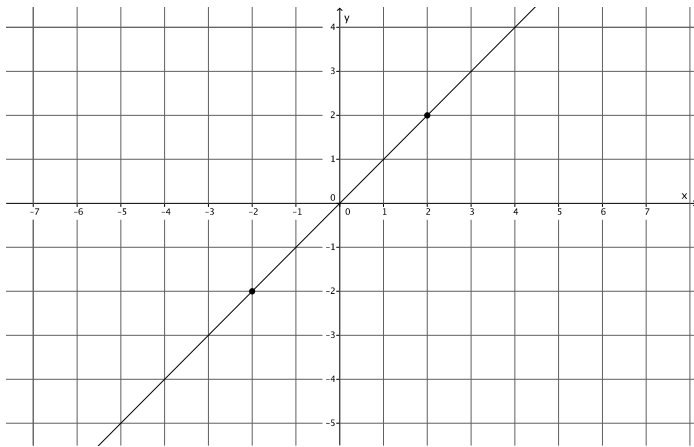
**Graph B**



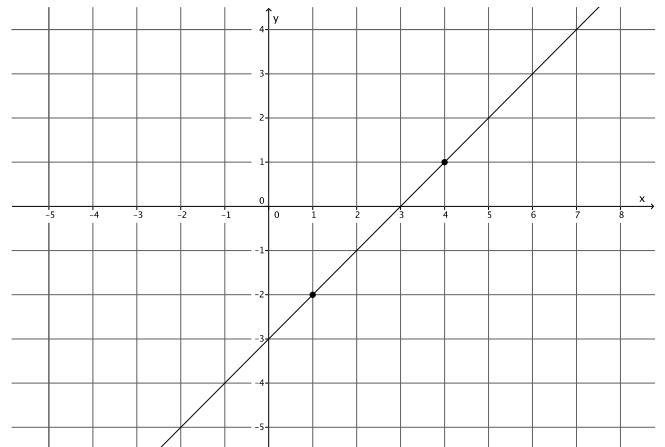
- g. Which graph is steeper?
- h. Write directions that explain how to move from one point on the graph to the other for both Graph A and Graph B.
- i. Write the directions from part (b) as ratios, and then compare the ratios. How does this relate to which graph was steeper in part (a)?

**Pair 4:**

**Graph A**



**Graph B**



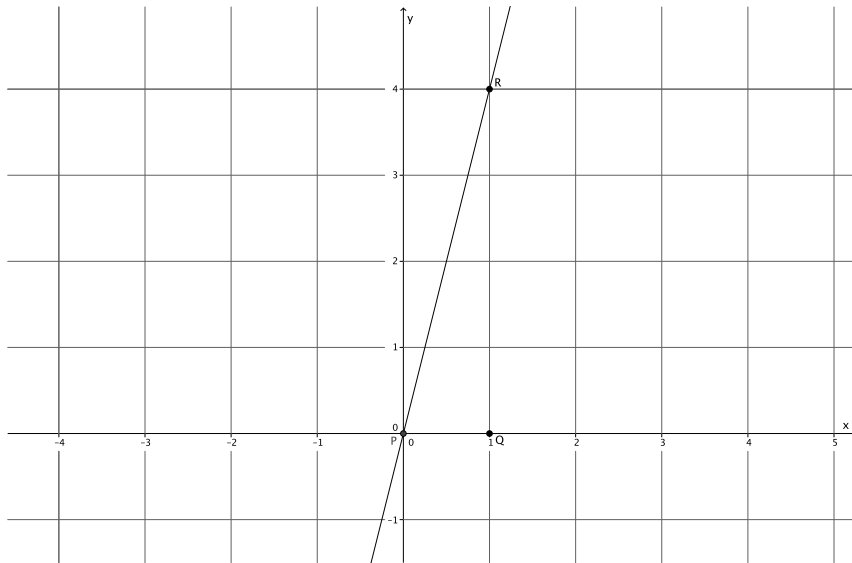
j. Which graph is steeper?

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

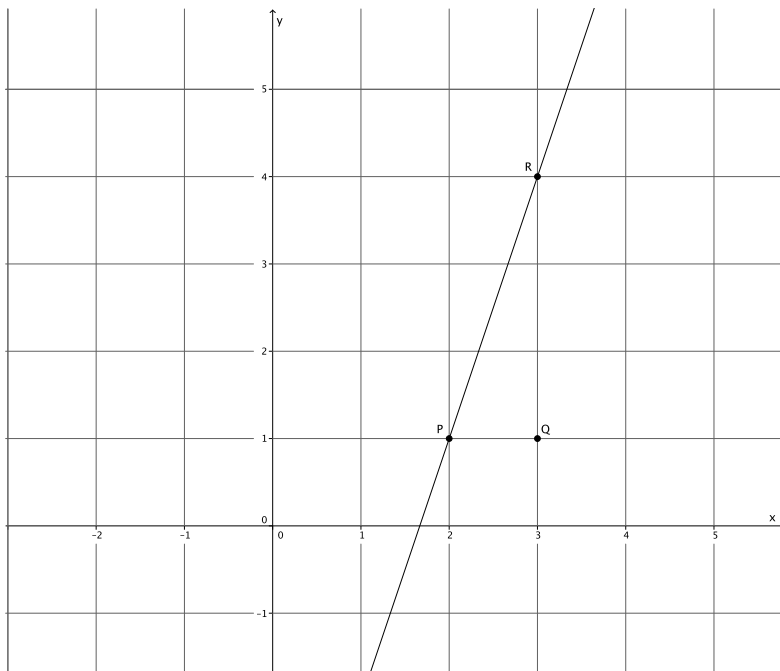
l. Write the directions from part (b) as ratios, and then compare the ratios. How does this relate to which graph was steeper in part (a)?

## Exercises

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

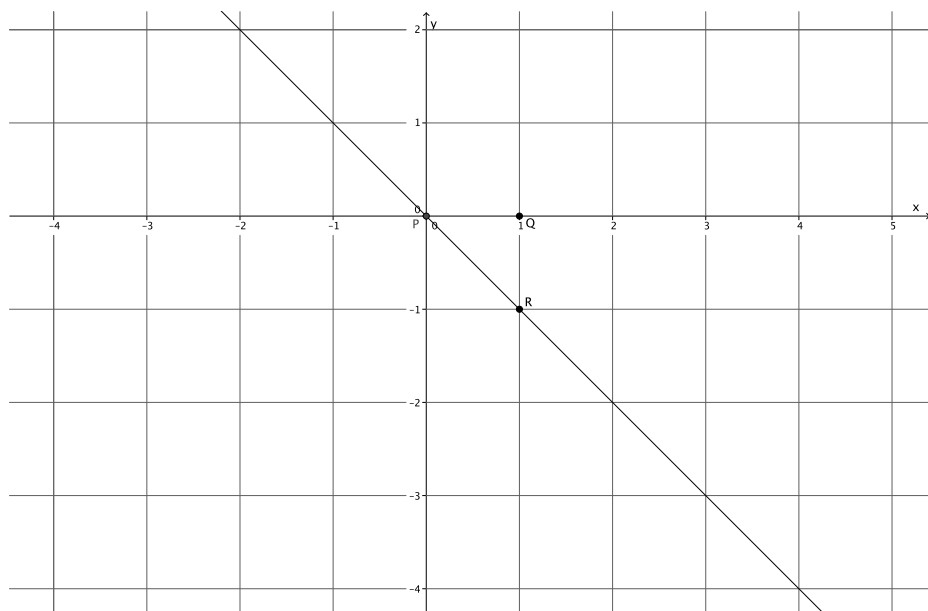


3. What is the slope of this non-vertical line?

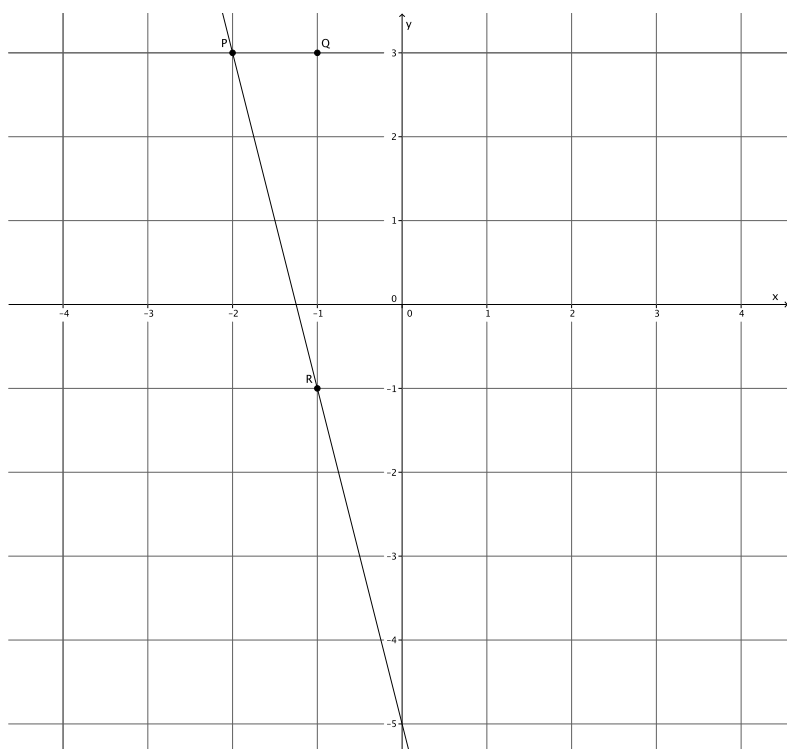


4. Which of the lines in Exercises 1 and 2 is steeper? Compare the slopes of each of the lines. Is there a relationship between steepness and slope?

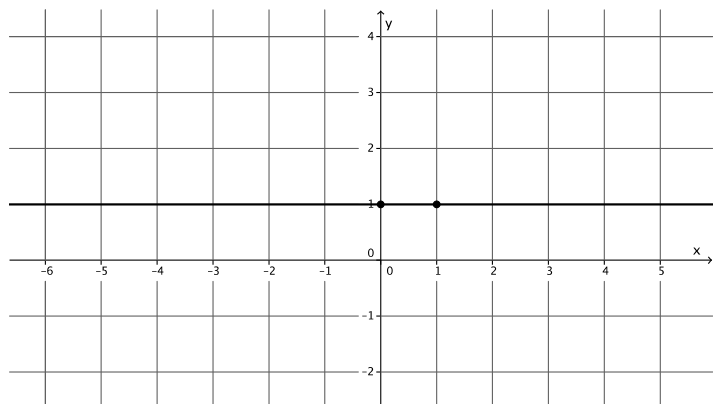
5. What is the slope of this non-vertical line?



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

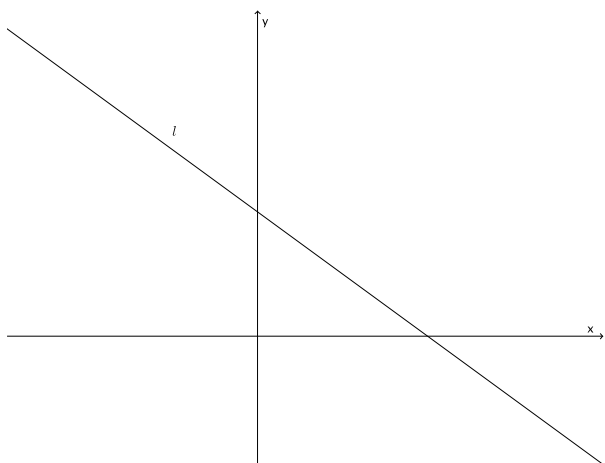


7. What is the slope of this non-vertical line?



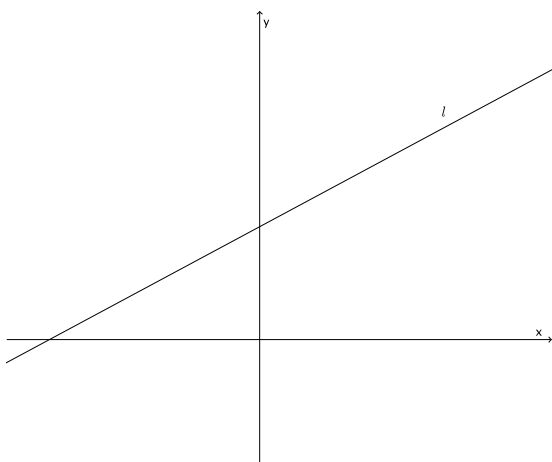
### Problem Set

8. Does the graph of the line shown below have a positive or negative slope? Explain.

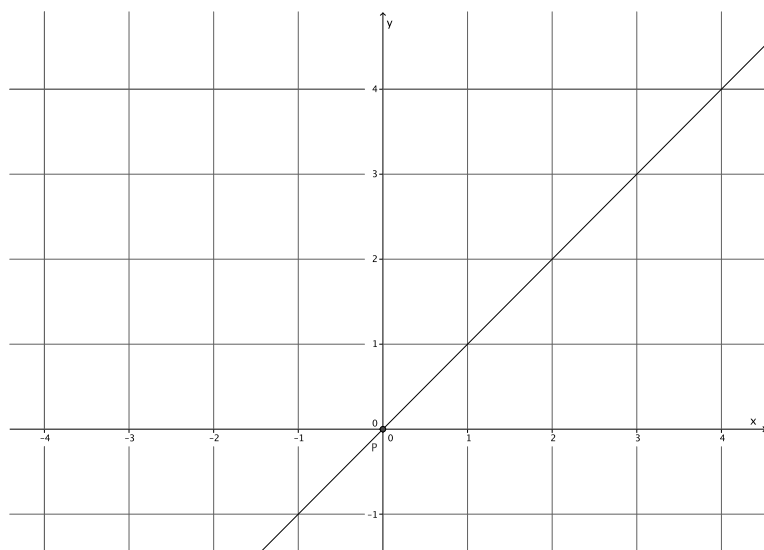




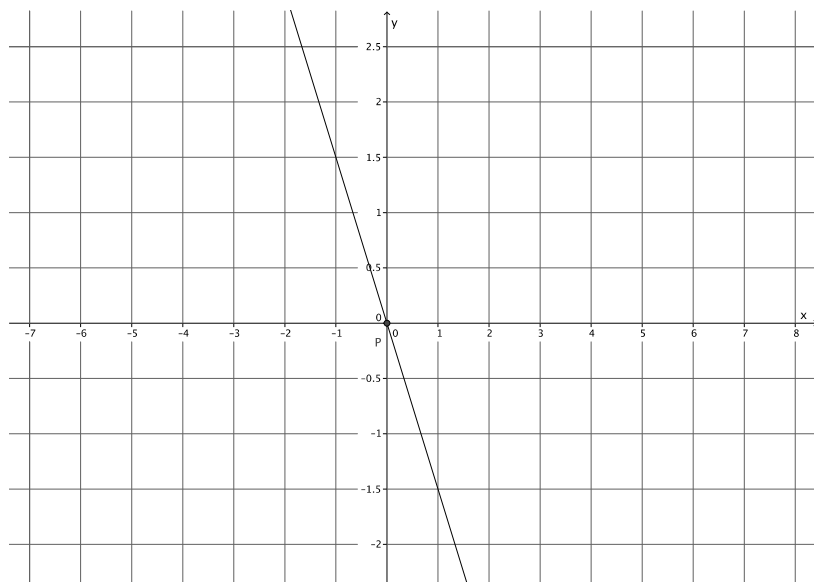
9. Does the graph of the line shown below have a positive or negative slope? Explain.



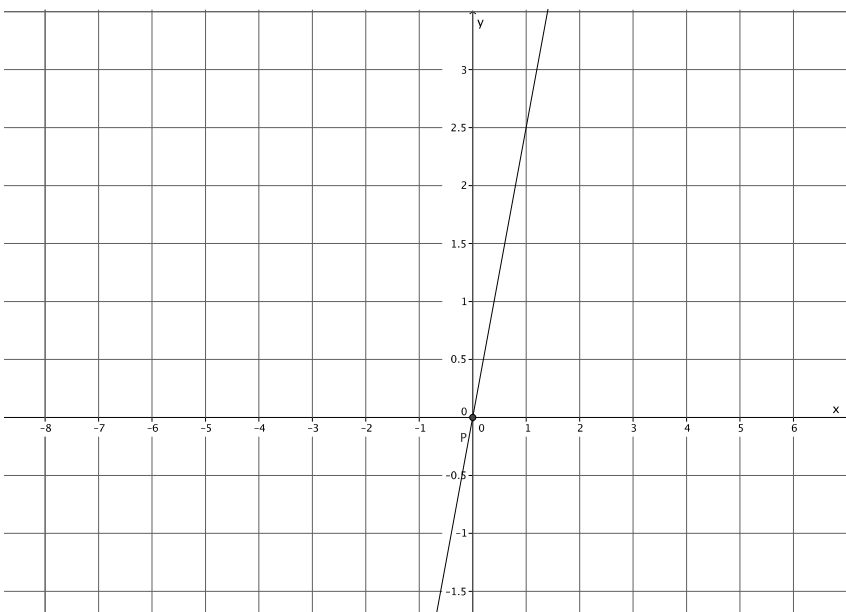
10. What is the slope of this non-vertical line?



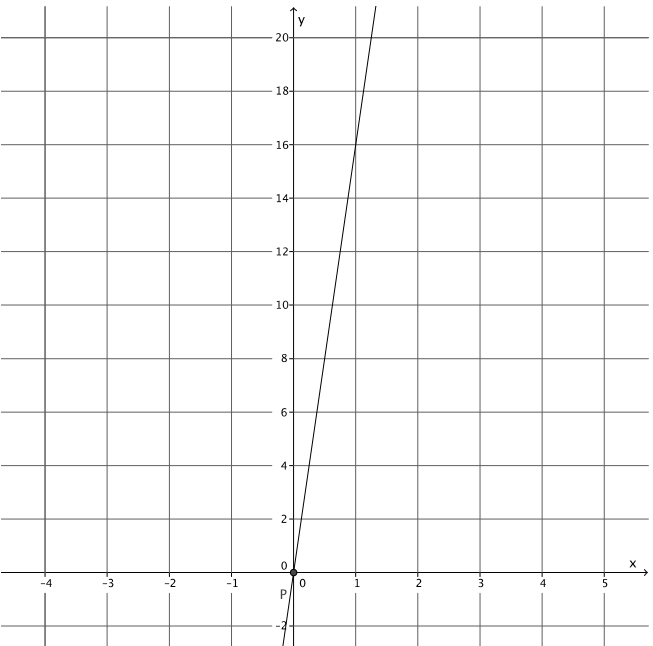
11. What is the slope of this non-vertical line?



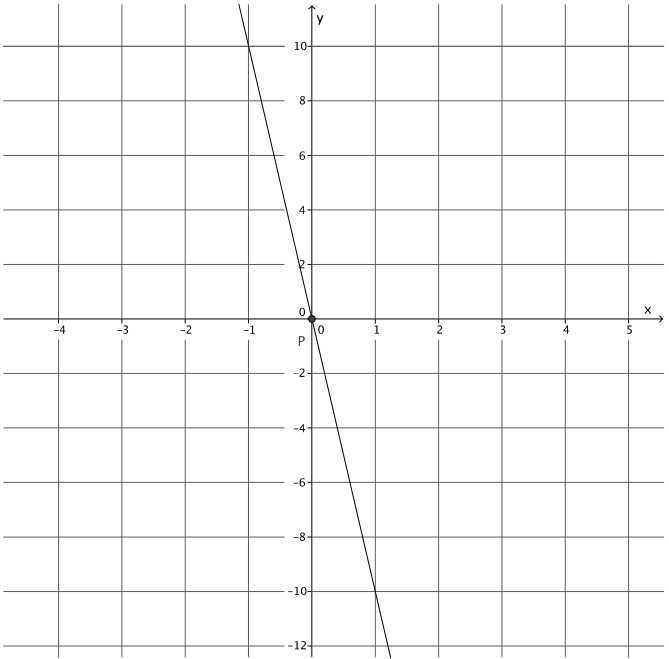
12. What is the slope of this non-vertical line?



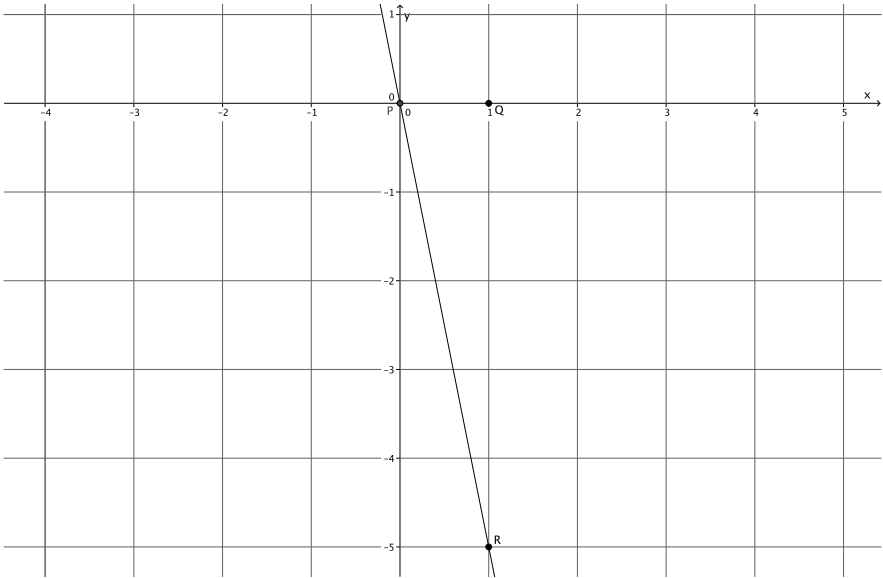
13. What is the slope of this non-vertical line?



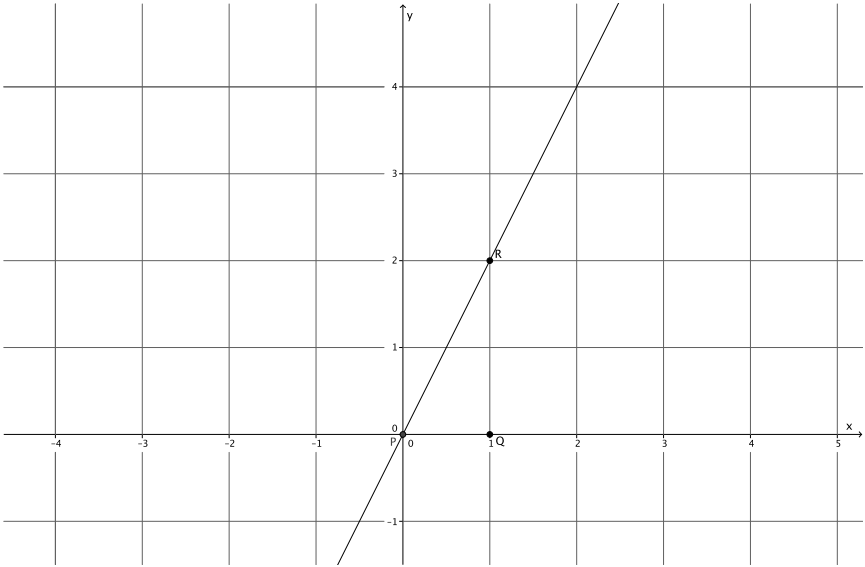
14. What is the slope of this non-vertical line?



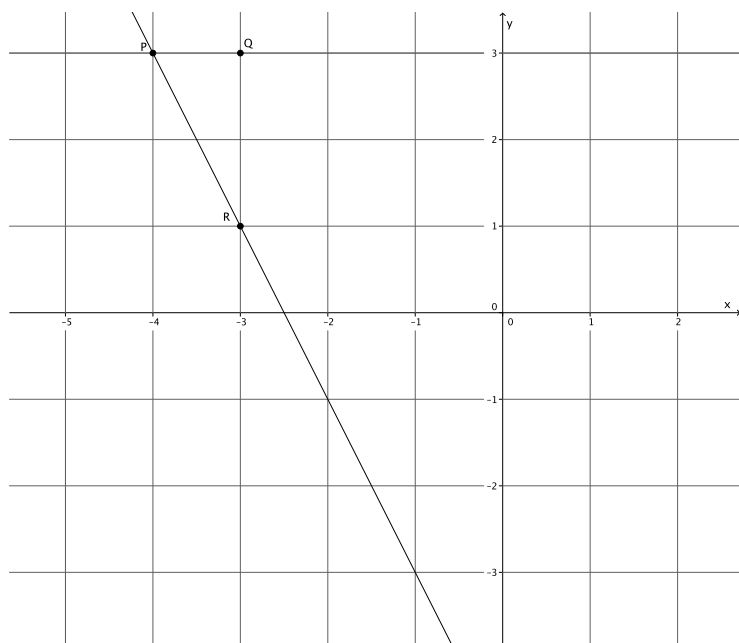
15. What is the slope of this non-vertical line?



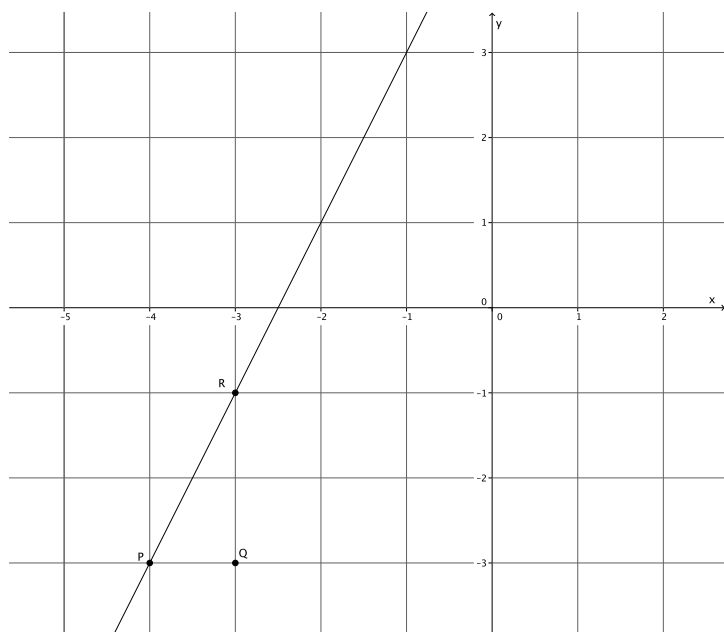
16. What is the slope of this non-vertical line?



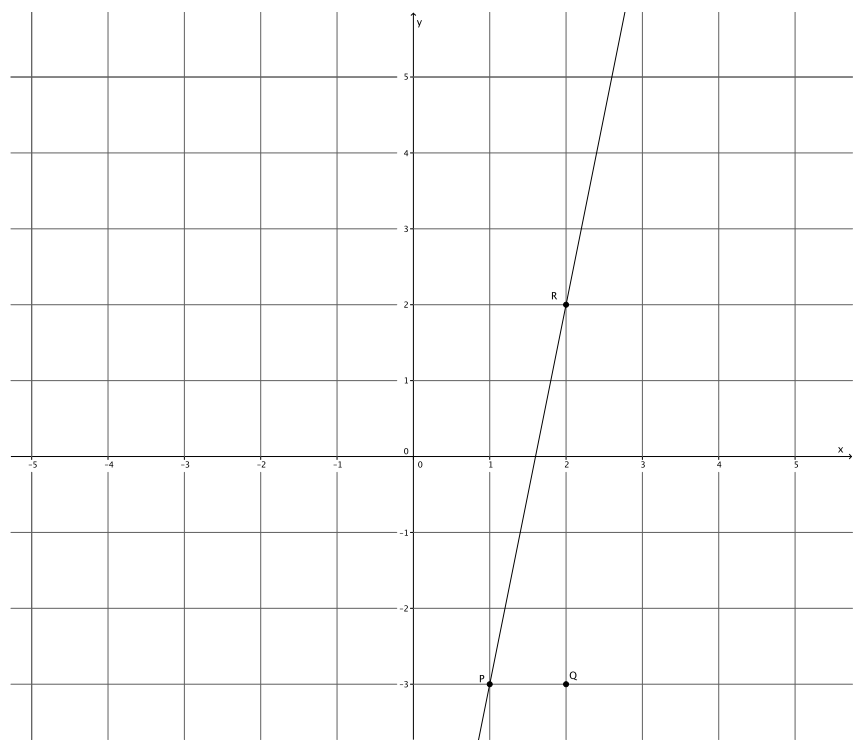
17. What is the slope of this non-vertical line?



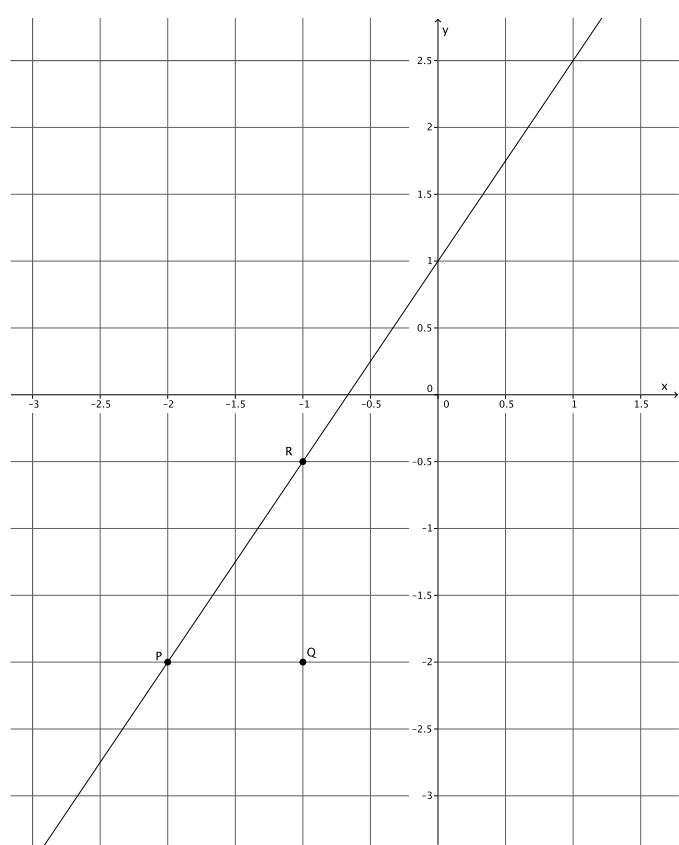
18. What is the slope of this non-vertical line?



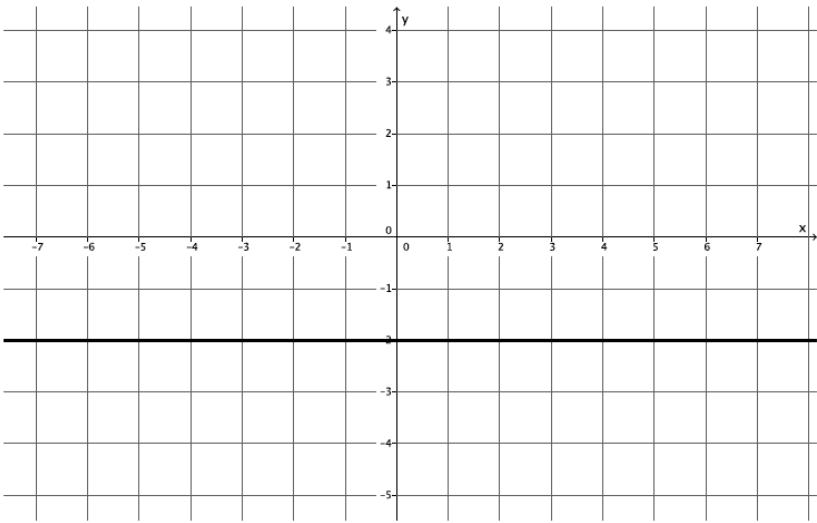
19. What is the slope of this non-vertical line?



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



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

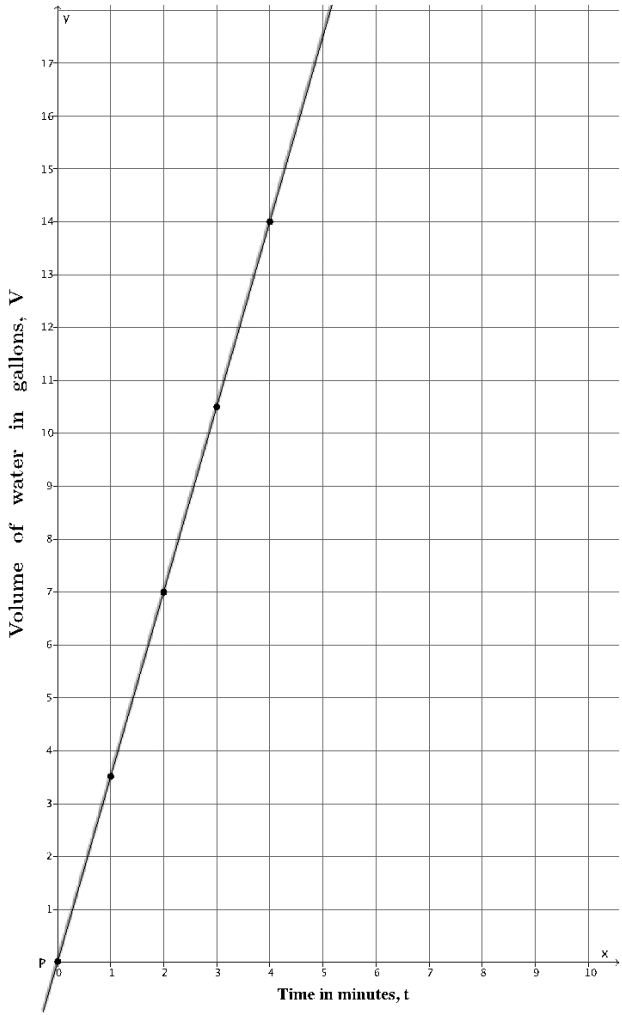


Use the table and the graphs provided to answer the questions that follow.

22. Suppose the volume of water that comes out in three minutes is 10.5 gallons.

$t$ (time in minutes)	Linear equation: $V = \frac{10.5}{3}t$	$V$ (in gallons)
0	$V = \frac{10.5}{3}(0)$	0
1	$V = \frac{10.5}{3}(1)$	$\frac{10.5}{3} = 3.5$
2	$V = \frac{10.5}{3}(2)$	$\frac{21}{3} = 7$
3	$V = \frac{10.5}{3}(3)$	$\frac{31.5}{3} = 10.5$
4	$V = \frac{10.5}{3}(4)$	$\frac{42}{3} = 14$

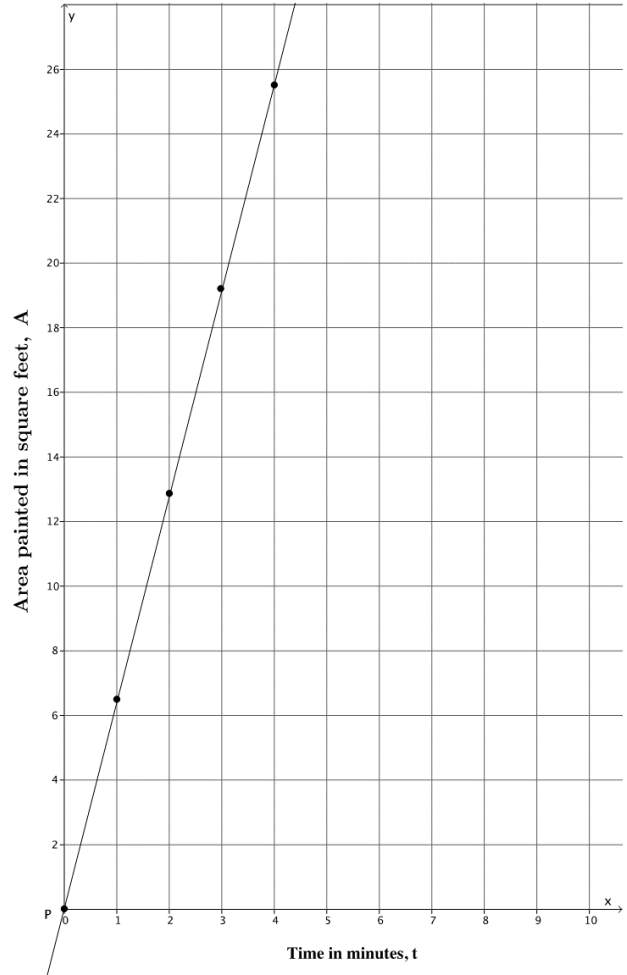
- How many gallons of water flow out of the faucet per minute? In other words, what is the unit rate of water flow?
- Assume that the graph of the situation is a line, as shown in the graph. What is the slope of the line?



23. 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?





24. 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

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

