

Lesson 5-1B Rate of Change and Slope

Problem 3 Finding Slope Using Points

What is the slope of the line through $(-1, 0)$ and $(3, -2)$?

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$$

Got It?

What is the slope of the line through each of these pairs of points?

- $(1, 3)$ and $(4, -1)$
- $(-3, 2)$ and $(1, 5)$

Problem 1 Finding Rate of Change Using a Table

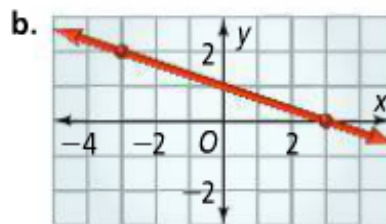
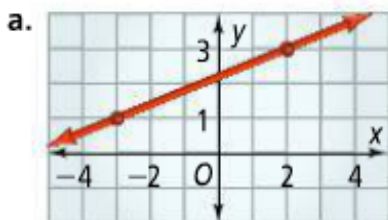
Marching Band The table shows the distance a band marches over time. Is the rate of change in distance with respect to time constant? What does the rate of change represent?

Distance Marched

Time (min)	Distance (ft)
1	260
2	520
3	780
4	1040

Problem 2 Finding Slope Using a Graph

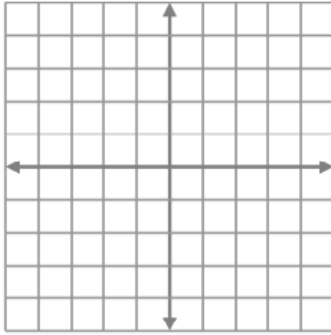
2. What is the slope of each line in parts (a) and (b)?



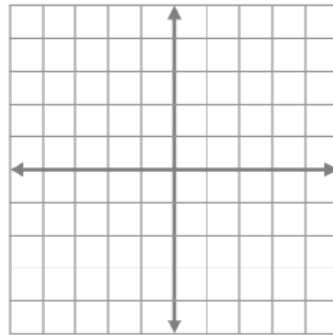


There are some lines that have slopes that make it particularly confusing when we try to write their equations. In this activity, we will investigate these “interesting” slopes. Fill in the blanks for the lines that pass through the points given.

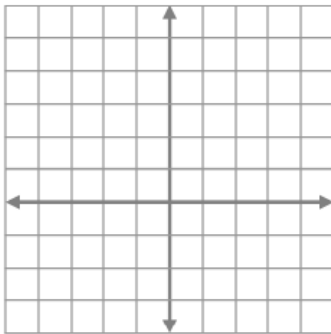
1. A line passes through $(-3, 2)$ and $(1, 2)$
 Slope: _____
 y-intercept: _____
 Equation: _____



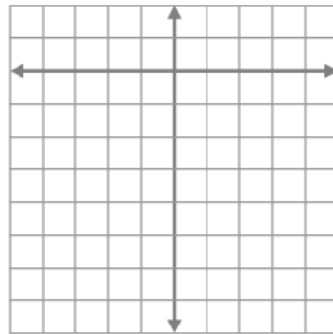
2. A line passes through $(-2, -1)$ and $(5, -1)$
 Slope: _____
 y-intercept: _____
 Equation: _____



3. A line passes through $(-3, 0)$ and $(4, 0)$
 Slope: _____
 y-intercept: _____
 Equation: _____

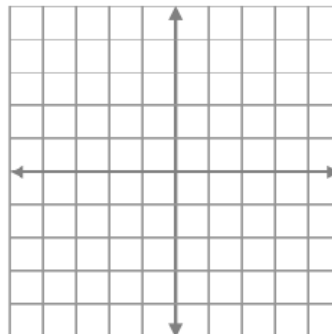


4. A line passes through $(4, -7)$ and $(-5, -7)$
 Slope: _____
 y-intercept: _____
 Equation: _____

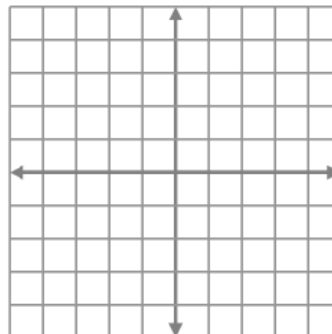


- What do all the lines in problems 1-4 have in common?
- Describe what the graphs of these lines look like.
- Describe what the equations of these lines look like.
- Explain how to write the equation of any horizontal line.

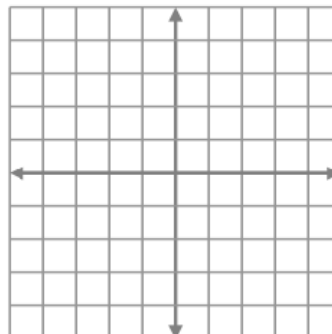
9. Suppose a line passes through $(2, -3)$ and $(2, 1)$.
- What is the slope of this line? _____
 - What is the y -intercept of this line? _____
 - Name 3 more points on line: _____
 - What do all these points have in common?
 - What is the simplest way to write your answer to part d?



10. Suppose a line passes through $(-1, -2)$ and $(-1, 5)$.
- What is the slope of this line? _____
 - What is the y -intercept of this line? _____
 - Name 3 more points on line: _____
 - What do all these points have in common?
 - What is the simplest way to write your answer to part d?



11. Suppose a line passes through $(0, -3)$ and $(0, 4)$
- What is the slope of this line? _____
 - What is the y -intercept of this line? _____
 - Name 3 more points on line: _____
 - What do all these points have in common?
 - What is the simplest way to write your answer to part d?



13. What do all the lines in problems 9-11 have in common?
14. Describe what the graphs of these lines look like.
15. Describe what your answers to part e of these questions have in common.
16. Explain how to write the equation of any vertical line.

5-1 Rate of Change and Slope - Notes

Example 1. Each pair of points lies on a line with the given slope. Find x.

- a. (2, 4) and (x, 8); slope = -2 b. (2, 4) and (x, 8); slope = $-\frac{1}{2}$