

Additional Practice

Investigation 2

Thinking With Mathematical Models

For Exercises 1–4, write an equation and sketch a graph for the line that meets the given conditions.

1. A line with slope 3.5 and y-intercept $(0, 4)$

2. A line with slope $\frac{3}{2}$ that passes through the point $(-2, 0)$

3. A line that passes through the points $(2, 7)$ and $(6, 15)$

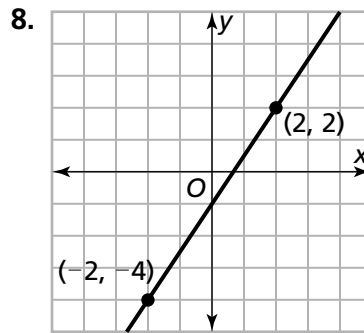
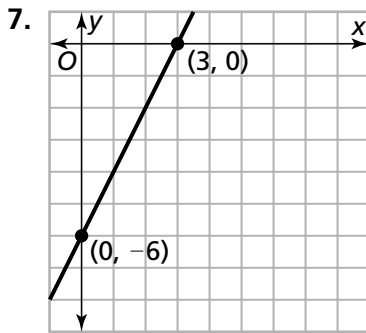
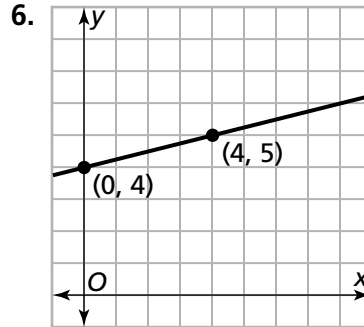
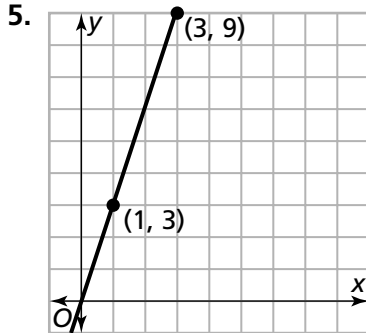
4. A line that passes through the points $(2, 1)$ and $(6, 9)$

Additional Practice *(continued)*

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For Exercises 5–8, write an equation for the line shown. Identify the slope and y-intercept.



9. For parts (a)–(c), write an equation and sketch a graph for the line that meets the given conditions. Use one set of axes for all three graphs.

a. A line with slope $\frac{2}{3}$ and y-intercept (0, 0)

b. A line with slope $\frac{2}{3}$ that passes through the point (6, 6)

c. A line with slope $\frac{2}{3}$ that passes through the point (6, 2)

d. What do you notice about the equations and graphs of the three lines?

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10. For parts (a)–(c), write an equation and sketch a graph for a line that meets the given conditions. Use one set of axes for all three graphs.
- A line with slope 3 and y -intercept $(0, 5)$
 - A line parallel to the line drawn in part (a) with a y -intercept greater than 5
 - A line parallel to the line drawn in parts (a) and (b) with a y -intercept less than 5
 - What do you notice about the equations and graphs of the three lines?

For Exercises 11–12, write an equation and sketch a graph for the line that meets the given conditions.

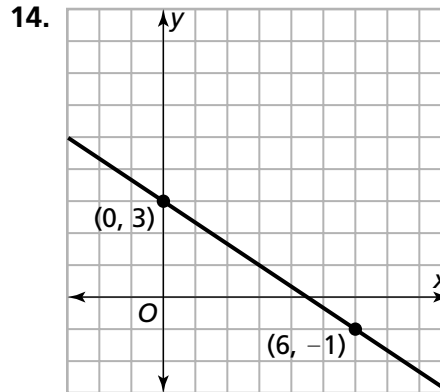
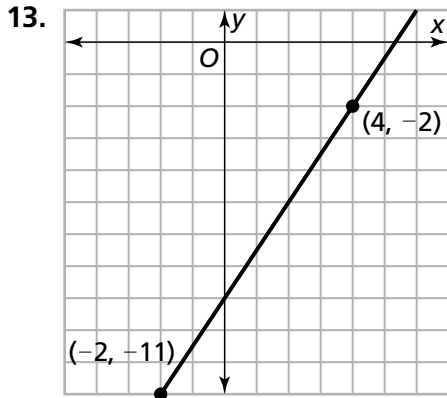
11. A line with slope $-\frac{15}{5}$ that passes through the point $(-2.5, 4.5)$
12. A line that passes through the points $(2, -9)$ and $(-2, 3)$

Additional Practice *(continued)*

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For Exercises 13–14, write an equation for the line shown. Identify the slope and y -intercept.



15. For parts (a)–(c), write an equation and sketch a graph for the line that meets the given conditions. Use one set of axes for all three graphs.

a. A line with slope -2 and y -intercept $(0, 0)$

b. A line with slope -2 that passes through the point $(3, -3)$

c. A line with slope -2 that passes through the point $(3, -9)$

d. What do you notice about the equations and graphs of the three lines?

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16. For parts (a)–(c), write an equation and sketch a graph for a line that meets the given conditions. Use one set of axes for all three graphs.
- a. A line with slope $-\frac{1}{2}$ and y-intercept (0, 3)
 - b. A line parallel to the line drawn in part (a) with a y-intercept greater than 3
 - c. A line parallel to the line drawn in parts (a) and (b) with a y-intercept less than 3
 - d. What do you notice about the equations and graphs of the three lines?

17. a. Predict how high a stack of 10 cups would be.

Stack of Styrofoam Cups

Number of Cups	1	2	3	4
Height of the Stack of Cups (cm)	7	8	9	10

- b. Describe the pattern in words.
- c. Describe the pattern with an equation. Let x represent the number of cups and h the height.
- d. What does the coefficient of x mean in this context? Does it have a unit of measure? Explain.
- e. What does the constant term mean in this context? Does it have a unit of measure? Explain.

Additional Practice *(continued)*

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18. To the right are the graphs of three lines.

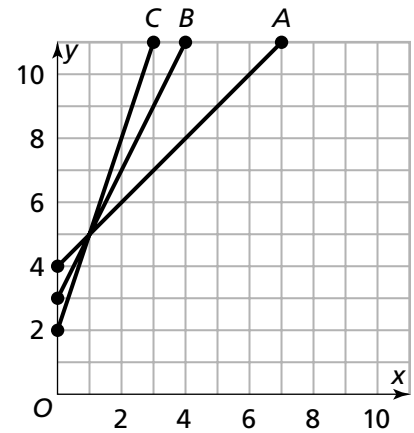
a. Match each line with its rule.

$y = x + 4$

$y = 2x + 3$

$y = 3x + 2$

b. For each equation, what are the y -values when $x = 3$?
When $x = 4$?



c. Why are the y -values “farther apart” when $x = 4$ than when $x = 3$?

19. Find exact solutions for each of these equations.

a. $9 - x = 3x - 7$

b. $3.6x + 2.4 = 2.1x - 0.6$

20. Find at least three values of x for which the inequality is true.

a. $5x - 3 \leq 12$

b. $8x - 1 \leq 4x + 7$