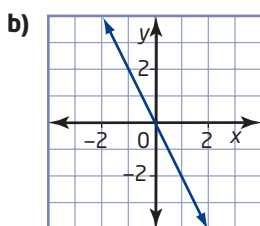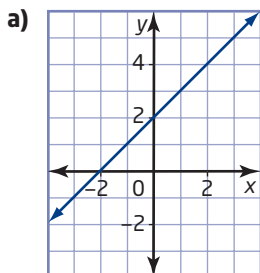# Chapter 6 Review

6.1 The Equation of a Line in Slope y-Intercept Form: $y = mx + b$, pages 296–307

1. Identify the slope and the y-intercept of each line.

a)

b)

2. Identify the slope and the y-intercept of each line.
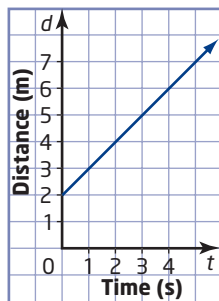
a) $y = -3x + 2$ b) $y = \dfrac{3}{5}x - 1$

3. Write the equation of a line with the given slope and y-intercept. Then, graph the line.

a) $m = -2, b = 3$

b) $m = \dfrac{2}{3}, b = -4$

c) $m = 0, b = 2$

4. The distance-time graph illustrates a person's movements in front of a motion sensor.

a) Identify the slope and the d-intercept. Explain what they mean.

b) Write an equation in the form $d = mt + b$ that describes the walker's motion.

6.2 The Equation of a Line in Standard Form: $Ax + By + C = 0$, pages 308–314

5. Rewrite each equation in the form $y = mx + b$.

a) $2x + y - 6 = 0$

b) $3x + 5y + 15 = 0$

6. A plumber charges according to the equation $60n - C + 90 = 0$, where C is the total charge, in dollars, for a house call, and n is the time, in hours, the job takes.

a) Rearrange the equation to express it in the form $C = mn + b$.

b) Identify the slope and the C-intercept and explain what they mean.

c) Graph the relation.

d) What would a 3-h house call cost?

6.3 Graph a Line Using Intercepts, pages 315–322

7. Determine the x- and y-intercepts of each line. Then, graph the line.

a) $3x - 4y = 12$

b) $6x - y = 9$

8. Cindy is at a baseball game with her younger brother, Mike. She has $18 to spend on hamburgers and pop. Hamburgers cost $3 each and pop cost $2 each.

a) If Cindy buys only hamburgers, how many can she buy?

b) If she buys only pop, how many can she buy?

c) The equation $2x + 3y = 18$ can be used to model this problem. Graph this line. What other combinations can Cindy buy?

6.4 Parallel and Perpendicular Lines, pages 326–329

9. Explain how the slopes of parallel lines are related. Create an example to support your explanation.

10. Explain how the slopes of perpendicular lines are related. Create an example to support your explanation.

6.5 Find an Equation for a Line Given the Slope and a Point, pages 330–337

11. Find an equation for a line with a slope of $\frac{2}{3}$, passing through $(1, -4)$.

12. Find an equation for a line parallel to $3x - 4y = 12$, with an x-intercept of 6.

13. Find an equation for a line perpendicular to $y = 2x - 3$, passing through the origin.

14. An airplane must always carry a minimum amount of fuel, above what is needed for the flight. Seth's plane burns fuel at a constant rate of 32 L/h. For a 2-h flight, Seth has to carry 88 L of fuel.

   a) What is the minimum amount of extra fuel that Seth must carry in his plane at all times?

   b) Write an equation that relates the amount of fuel, in litres, required versus the trip length, in hours.

   c) The fuel tank in Seth's plane has a capacity of 160 L. How long can he fly before having to refuel?

   d) If Seth tunes up his plane, the fuel burn rate reduces to 24 L/h. How does this change your answers to parts b) and c)?

6.6 Find the Equation of a Line Given Two Points, pages 338–343

15. Find an equation for a line passing through $(-2, 5)$ and $(3, -5)$.

16. Claudia is walking at a constant speed in front of a motion sensor. After 1 s, she is 2.5 m from the sensor. 2 s later, she is 4.0 m from the sensor.

   a) Find the equation in the form $d = mt + b$ that describes her motion.

   b) Determine the slope and the d-intercept and explain what they mean.

   c) How far will Claudia be from the sensor 5 s after she begins walking?

6.7 Linear Systems, pages 344–351

17. a) Solve the following linear system:

$$y = \frac{1}{3}x - 2$$

$$y = -x - 6$$

   b) Check that the solution is correct by substituting into both equations.

18. Two tutors charge according to the following equations, relating the tutoring charge, C, in dollars, to the time, t, in hours:
   • Mr. Wellington: $C = 40t$
   • Ms. Tenshu: $C = 35t + 20$

   a) Solve the linear system and explain what the solution means.

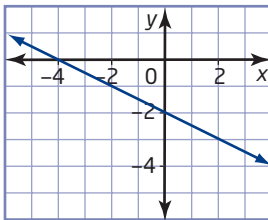   **b)** Under what conditions should a student hire either tutor? Explain any assumptions you must make.

Multiple Choice

For questions 1 to 5, select the best answer.

1. Which are the slope and the *y*-intercept of the line $y = -3x - 1$?

A $m = 3, b = 1$

B $m = -3, b = 1$

C $m = -3, b = -1$

D $m = \dfrac{1}{3}, b = -1$

2. What are the *x*- and *y*-intercepts of the line?

A *x*-intercept = 2, *y*-intercept = 4

B *x*-intercept = −2, *y*-intercept = −4

C *x*-intercept = −4, *y*-intercept = 2

D *x*-intercept = −4, *y*-intercept = −2

3. Which line is parallel to the line $y = \dfrac{1}{5}x - 1$?
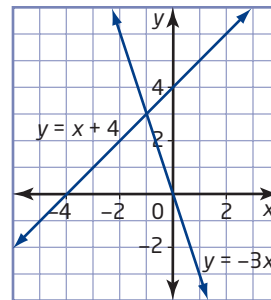
A $y = -\dfrac{1}{5}x - 1$ **B** $y = \dfrac{1}{5}x + 3$

C $y = 5x + 1$ **D** $y = -5x - 4$

4. Which line is perpendicular to the line $y = \dfrac{3}{2}x - 1$?

A $y = \dfrac{2}{3}x + 1$ **B** $y = -\dfrac{2}{3}x + 4$

C $y = \dfrac{3}{2}x - 3$ **D** $y = -\dfrac{3}{2}x - 1$

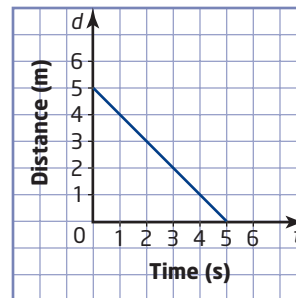**5.** Which is a solution to the linear system?

A $(-1, 3)$

B $(-4, 0)$

C $(0, 4)$

D $(3, -1)$

Short Response

Show all steps in your solutions.

6. The distance-time graph of a person walking at a constant speed in front of a motion sensor is shown.

a) How far from the motion sensor was the person when she began walking?

b) Was she moving toward or away from the sensor? Explain how you know.

c) How fast was she walking?

d) Write an equation that describes this distance-time relationship.

7. a) What are the *x*- and *y*-intercepts of the line $3x - y = 6$?

b) Use this information to graph the line.

8. An electrician charges according to the equation $75n - C + 60 = 0$, where C is the total charge, in dollars, for a house call, and n is the time, in hours, the job takes.

a) Rearrange this equation to express it in the form $C = mn + b$.

b) Identify the slope and the C-intercept and explain what they mean.

c) Graph the relation.

d) What would a 2-h house call cost?

9. Find an equation for a line with a slope of $\frac{2}{3}$ that passes through the point $(4, -1)$.

10. Find an equation for a line passing through the points $(-3, -4)$ and $(6, 8)$.

11. You can use the formula $L = 3.8G$ to obtain an approximate value for converting a volume in U.S. gallons, G, to a volume in litres, L.

a) Use the formula to find the number of litres in
- 0.5 gallons
- 1 pint (1 pint = 0.125 gallons)

b) Rearrange the formula to express G in terms of L.

c) How many gallons are in
- 4 L?
- 250 mL?

Extended Response

Provide complete solutions.

12. Find an equation for a line that is perpendicular to $2x - 3y + 6 = 0$ and has the same x-intercept as $3x + 7y + 9 = 0$.

13. A video rental company has two monthly plans:
- Plan A: $40 for unlimited rentals
- Plan B: $10 plus $3 per video

a) Graph this linear system and find the solution.

b) Explain the conditions under which each plan is better.

14. Tess is flying an airplane from Wainfleet to her cottage at a constant speed. She takes off at noon and passes St. Catharines at 12:15. Tess knows that St. Catharines is 40 km from Wainfleet.

a) How fast is Tess's airplane flying, in kilometres per hour?

b) Write an equation relating distance travelled to flight time.

c) Assuming Tess continues on a straight path, at what time will she arrive at her cottage, which is 360 km due north of St. Catharines?

Chapter Problem Wrap-Up

By now you should have all eight letters in the name of Jean's home city. All you need to do is unscramble them.

Create a problem like this one based on the name of your city or town. Or, if you prefer, pick a city or town of a friend or relative. Then, trade problems with a classmate and try to discover each other's mystery location. Happy math-caching!