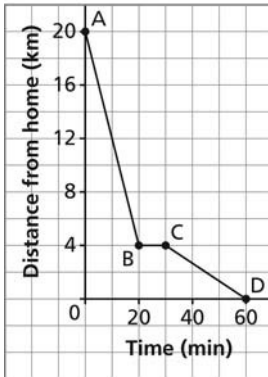


iii) Independent variable:  $x$ ; dependent variable:  $y$ ; rate of change:  $-\frac{1}{2}$

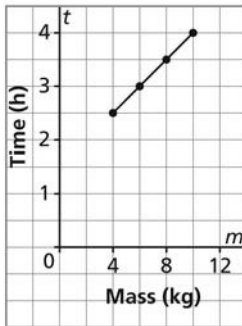
4. Situation: Jamie's school is 20 km from her home. Jamie rides her friend's bike from school to her friend's home, which is 4 km from her own home. She arrives at her friend's home 20 min after she left school. She talks to her friend for 10 min, then walks the remaining 4 km home in 30 min.

**Jamie's Journey Home**



5. a) The relation is a function because no number is repeated in the first column.  
 b) Dependent variable: time; independent variable: mass  
 c)

**Time Needed to Cook a Turkey**



I connected the points because both time and mass are not discrete data.

- d) Domain:  $4 \leq m \leq 10$ ; range:  $2.5 \leq t \leq 4.0$   
 e) 0.25 h/kg; for every additional kilogram, the time needed to cook the turkey increases by 0.25 h.  
 f) 3.25 h or 3 h 15 min

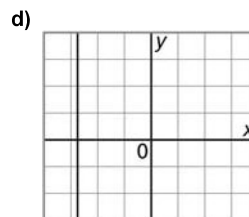
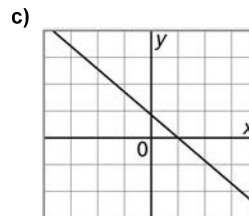
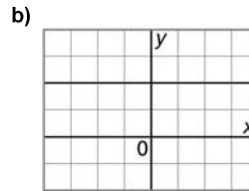
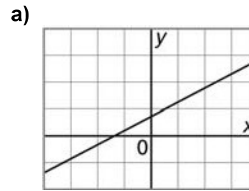
**Chapter 6 Linear Functions, page 330**

**6.1 Slope of a Line, page 339**

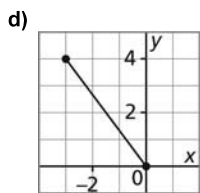
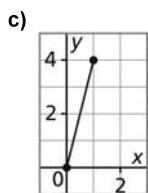
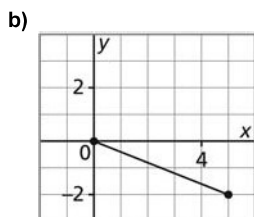
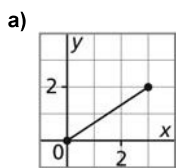
4. a)  $\frac{2}{11}$                       b)  $\frac{2}{7}$

5. a) Negative  
 b) Positive  
 c) Not defined  
 d) Zero  
 6. a) Rise: 3; run: 6; slope:  $\frac{1}{2}$   
 b) Rise: -2; run: 8; slope:  $-\frac{1}{4}$   
 c) Rise: 3; run: 4; slope:  $\frac{3}{4}$   
 d) Rise: -6; run: 2; slope: -3  
 7. a) 3  
 b)  $-\frac{7}{2}$   
 c)  $\frac{1}{2}$   
 d)  $-\frac{1}{2}$

8. Sketches may vary. The lines may be in different positions on the grid but they should have the same orientations as those shown.

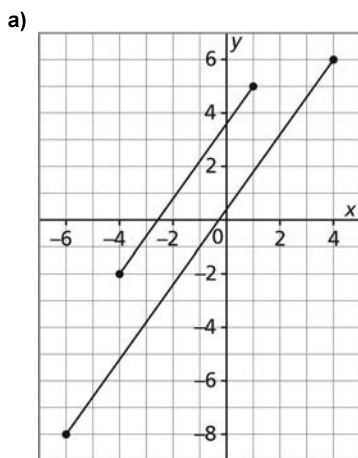


9. Sketches may vary. The line segments may have different lengths but they should have the same orientations as those shown.



11. a)  $\frac{1}{2}$   
 b)  $\frac{1}{2}$   
 c) The slopes in parts a and b are equal.

12. Diagrams may vary. For example:



b) Similarities: the line segments have the same slope; differences: they pass through different points

13. a) i) 2                      ii)  $\frac{1}{2}$   
           iii) -3                iv)  $\frac{1}{3}$

- b) i) As  $x$  increases by 1,  $y$  increases by 2.  
 ii) As  $x$  increases by 2,  $y$  increases by 1.  
 iii) As  $x$  increases by 1,  $y$  decreases by 3.  
 iv) As  $x$  increases by 3,  $y$  increases by 1.

14. a) Diagrams may vary.  
 b) i) The slopes of the segments are equal; all segments on the same line have the same slope.

15. a)  $\frac{1}{15}$ , or  $0.0\bar{6}$

b)  $13\frac{1}{2}$  in.

16. a)  $-\frac{1}{48}$

b) 312 in., or 26 ft.

c)  $4\frac{1}{2}$  in.

17. a) Line iv  
 b) Line iii  
 c) Line ii  
 d) Line i

18. a) i)  $-\frac{3}{5}$

ii)  $\frac{3}{5}$

iii)  $-\frac{3}{5}$

iv)  $\frac{3}{5}$

b) The slopes of BC and ED are equal. The slopes of BE and CD are equal. The two different slopes are opposites.

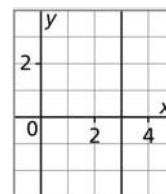
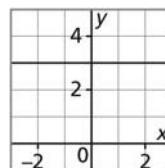
19. a) The slope of a horizontal line is 0 because its rise is 0, and the quotient of 0 and any number is zero.

b) The slope of a vertical line is undefined because its run is 0, and the quotient of any number and 0 is undefined; that is, I cannot divide by 0.

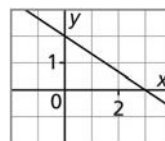
20. a)  $\frac{1}{3}$

21. Positions of lines on the grid may vary. For example:

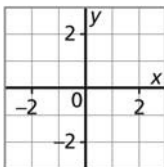
a) i)



ii)

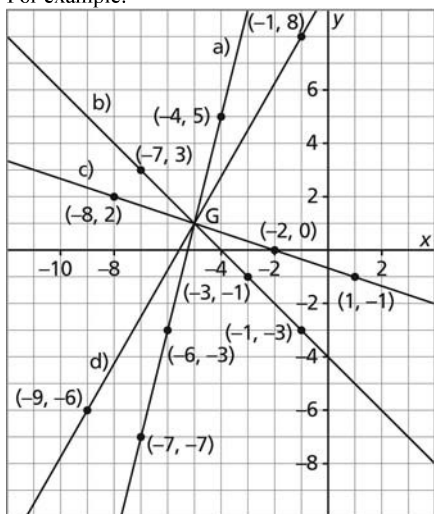


iii)



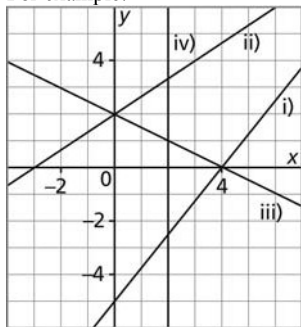
22. 840 cm, or 8.4 m  
 23. Coordinates may vary.

For example:



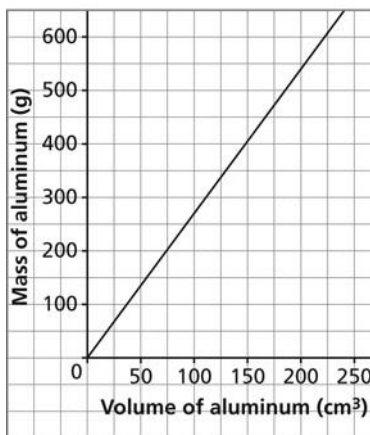
- a)  $(-4, 5)$ ,  $(-6, -3)$ ,  $(-7, -7)$   
 b)  $(-7, 3)$ ,  $(-3, -1)$ ,  $(-1, -3)$   
 c)  $(-8, 2)$ ,  $(-2, 0)$ ,  $(1, -1)$   
 d)  $(-1, 8)$ ,  $(-9, -6)$ ,  $(-13, -13)$
24. a) i) Positive  
 ii) Positive  
 iii) Negative  
 iv) Not defined  
 b) Sketches may vary.

For example:

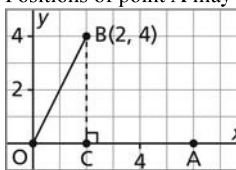


25. a)

### Mass and Volume of Aluminum

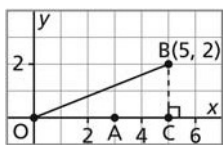


- b)  $2.7 \text{ g/cm}^3$   
 c) The slope shows that for every  $1 \text{ cm}^3$  increase in the volume of an aluminum cube, the mass of the cube increases by 2.7 g.  
 d) i) 135 g                      ii) 742.5 g  
 e) i) Approximately  $37 \text{ cm}^3$   
 ii) Approximately  $167 \text{ cm}^3$
26. a) The number of text messages is restricted to whole numbers.  
 b) \$0.15, or 15¢                      c) \$4.95  
 d) 48 text messages  
 e) Assumptions may vary. For example: I assumed that all messages cost the same.
27. a) \$45/month                      b) \$505  
 c) \$55  
 d) Assumptions may vary. For example: I assumed that Charin continues to save the same amount each month after the 5th month and that the savings account did not earn any interest.
28. a) 2                                      b)  $\frac{2}{3}$
29. No
30. a) Positions of point A may vary. For example:



- b) Slope of OB is 2;  $\tan \angle AOB = 2$

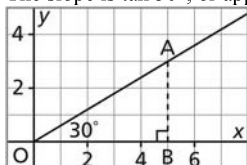
c)



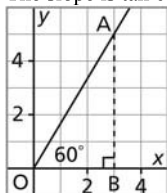
Slope of OB is  $\frac{2}{5}$ ;  $\tan \angle AOB = \frac{2}{5}$

d) The slope of a line segment is equal to the tangent of the angle formed by the segment and the positive x-axis. Both the slope and the tangent are equal to the quotient of the same two numbers.

31. a) The slope is  $\tan 30^\circ$ , or approximately 0.6.



b) The slope is  $\tan 60^\circ$ , or approximately 1.7.



c) No

### 6.2 Slopes of Parallel and Perpendicular Lines, page 349

3. a)  $\frac{4}{5}$

b)  $-\frac{4}{3}$

c) 3

d) 0

4. a)  $-\frac{6}{7}$

b)  $\frac{8}{5}$

c)  $-\frac{1}{9}$

d)  $\frac{1}{5}$

5. a) Parallel

c) Neither

6. a) i)  $-\frac{4}{9}$

b) Neither

d) Perpendicular

ii)  $\frac{9}{4}$

b) i) 5

ii)  $-\frac{1}{5}$

c) i)  $\frac{7}{3}$

ii)  $-\frac{3}{7}$

d) i) -4

ii)  $\frac{1}{4}$

7. Yes; the slope of the line through the golfer's club and the slope of the line through the golfer's feet are the same:

approximately  $-\frac{1}{6}$

8. a) i) A(-5, -2), B(1, 5) and C(-1, -4), D(4, 1)  
ii) Neither

b) i) E(-3, 4), F(3, 2) and G(2, 5), H(0, -1)  
ii) Perpendicular

c) i) J(-2, 3), K(1, -3) and M(3, 1), N(-4, -2)  
ii) Neither

d) i) P(0, 5), Q(6, 2) and R(-4, -1), S(0, -3)  
ii) Parallel

9. a) Perpendicular

b) Parallel

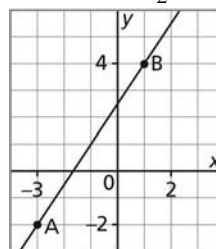
c) Neither

d) Neither

10. a) Both lines have positive slopes, which are reciprocals.

b) Both lines have positive slopes, which are reciprocals.

11. a) Slope of AB is  $\frac{3}{2}$ , or 1.5.



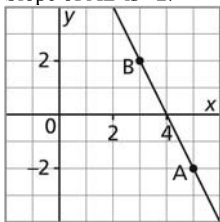
b) Slope of CD is  $\frac{3}{2}$ , or 1.5.

c) Answers may vary. For example: (1, 2), (3, 5)

d) Slope of AE is  $-\frac{2}{3}$ .

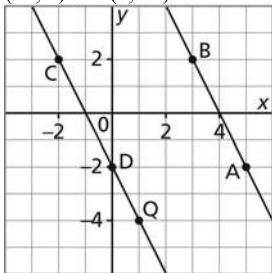
e) Answers may vary. For example: (0, -4), (3, -6)

12. a) Slope of AB is  $-2$ .



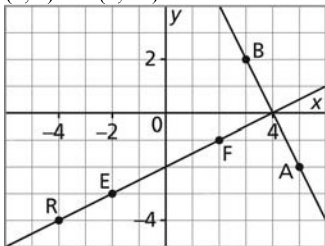
- b) Slope of CD is  $-2$ .

- c)  $(-1, 0)$  and  $(0, -2)$



- d) Slope of EF is  $\frac{1}{2}$ , or 0.5.

- e)  $(4, 0)$  and  $(0, -2)$



13. a) Yes

- b) No

14. Trapezoid

15. No

16. The slopes of BC and AC are negative reciprocals, so BC and AC are perpendicular: slope of BC:  $-2$ ; slope of AC:  $\frac{1}{2}$

17. Yes; The slopes of DE and EF are negative reciprocals, so DE and EF are perpendicular: slope of DE:  $\frac{3}{2}$ ;

slope of EF:  $-\frac{2}{3}$

18. Triangles may vary.

- c) In each case, the line segment that joins the midpoints of two sides of a triangle is parallel to the third side of the triangle.

19. a) No; no pairs of slopes are negative reciprocals.

- b)  $D(-2, -1)$

20. Coordinates may vary. For example:

- $(3, 7)$ ,  $(-9, 1)$ ,  $(6, 1)$ ,  $(-6, -5)$

21. Rhombuses may vary. The diagonals intersect at right angles.

22.  $c = -2$

23. a)  $a = 3\frac{1}{4}$ , or 3.25

- b)  $a = 1\frac{1}{5}$ , or 1.2

### Chapter 6: Checkpoint 1, page 353

1. Slope of AB:  $-\frac{2}{3}$ ; slope of CD:  $\frac{1}{4}$

2. a)  $-\frac{15}{4}$

- b)  $\frac{5}{3}$

3. Answers may vary. For example: The slope of a line is equal to the slope of any segment of the line, so we can use any two points that form that segment to determine the slope of the line.

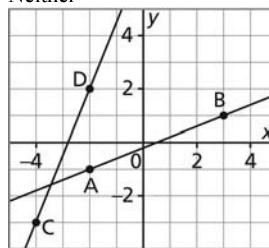
4. a) 25 km/h; Jordan's average speed

- b) Approximately 31 km

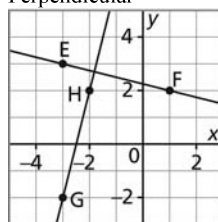
- c) 2.6 h, or 2 h 36 min

5. The positions of the lines on the grids and their labels may vary. For example:

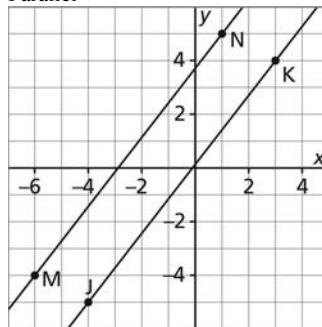
- a) Neither



- b) Perpendicular



- c) Parallel



6. Coordinates may vary. For example:

- a)  $(2, -2)$ ,  $(6, 1)$

- b)  $(5, -2)$ ,  $(2, 2)$

7. No, no two of the three slopes of the sides of the triangle are negative reciprocals.
8. Answers may vary. For example:  $(-12, 0)$ ,  $(0, -5)$

### 6.3 Math Lab: Investigating Graphs of Linear Functions, page 356

1. a) From top to bottom:

$$y = \frac{1}{2}x + 4, y = \frac{1}{2}x + 2, y = \frac{1}{2}x - 1,$$

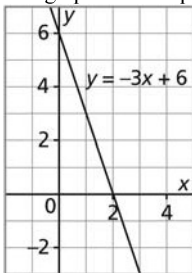
$$y = \frac{1}{2}x - 2, y = \frac{1}{2}x - 3$$

- b) From top to bottom:

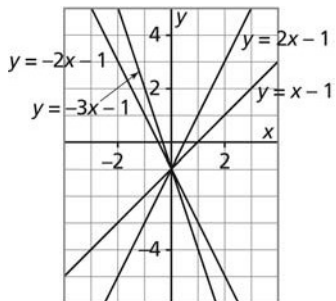
$$y = -\frac{1}{3}x + 4, y = -\frac{1}{3}x + 3, y = -\frac{1}{3}x + 1,$$

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

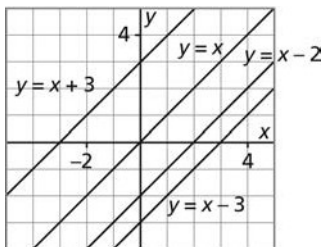
2.  $m$  represents the slope and  $b$  represents the  $y$ -intercept of the line. I could plot the  $y$ -intercept, then plot a point using the slope.
3. The graph has a slope of  $-3$  and a  $y$ -intercept of  $6$ .



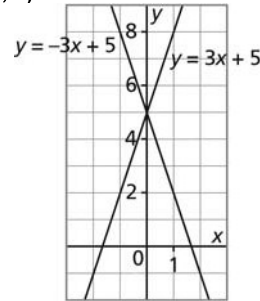
4. a) All the graphs have  $y$ -intercept  $-1$ .
- b)



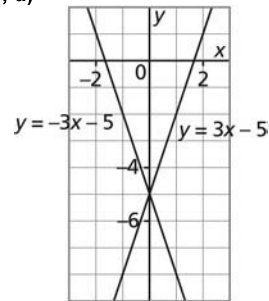
5. a) All the graphs have slope  $1$ .
- b)



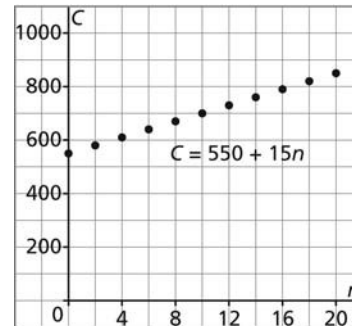
6. a), b)



- c), d)



7. a)



- b)  $m$  represents the slope or rate of change; that is, \$15 per person.  $b$  represents the initial cost of \$550 to rent the hall.

### 6.4 Slope-intercept Form of the Equation for a Linear Function, page 362

4. a) Slope:  $4$ ;  $y$ -intercept:  $-7$   
 b) Slope:  $1$ ;  $y$ -intercept:  $12$   
 c) Slope:  $-\frac{4}{9}$ ;  $y$ -intercept:  $7$   
 d) Slope:  $11$ ;  $y$ -intercept:  $-\frac{3}{8}$   
 e) Slope:  $\frac{1}{5}$ ;  $y$ -intercept:  $0$   
 f) Slope:  $0$ ;  $y$ -intercept:  $3$

5. a)  $y = 7x + 16$

b)  $y = -\frac{3}{8}x + 5$

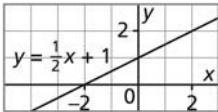
c)  $y = \frac{7}{16}x - 3$

d)  $y = -\frac{6}{5}x - 8$

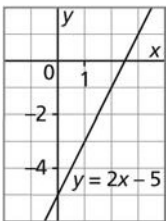
e)  $y = -\frac{5}{12}x$

6. Sketches may vary. For example:

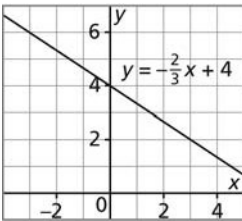
a)



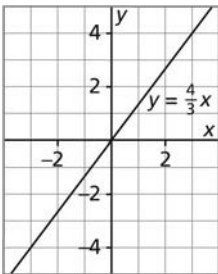
b)



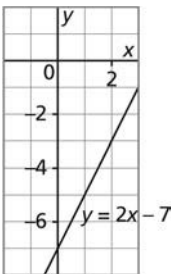
c)



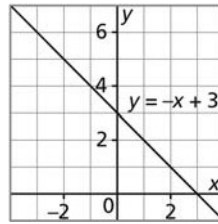
d)



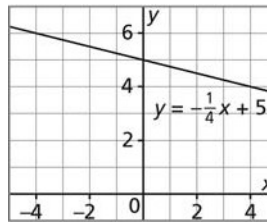
7. a)



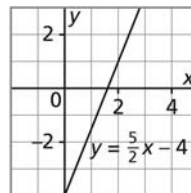
b)



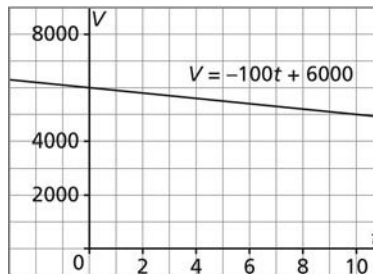
c)



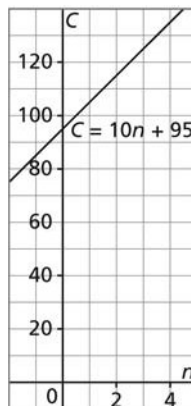
d)



e)



f)

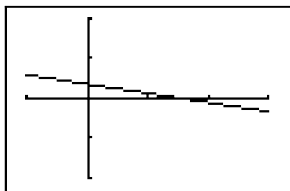


8. a)  $C = 50t + 80$

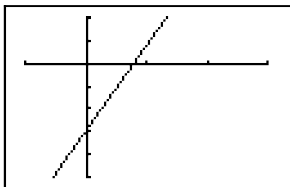
b)  $C = 40t + 100$

9.  $F = 0.02d + 3.50$

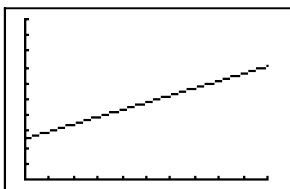
10. a)



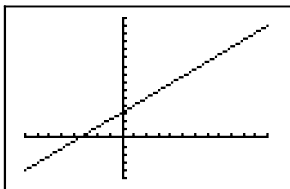
b)



c)



d)



11. a) The student may have confused the values of the slope and the  $y$ -intercept.

b)  $y = 4x - 3$

12. a) i) Slope:  $-\frac{1}{2}$ ;  $y$ -intercept: 2

ii)  $y = -\frac{1}{2}x + 2$

iii)  $y = -3$

b) i) Slope: 4;  $y$ -intercept:  $-6$

ii)  $y = 4x - 6$

iii)  $y = 34$

c) i) Slope:  $\frac{3}{4}$ ;  $y$ -intercept: 1

ii)  $y = \frac{3}{4}x + 1$

iii)  $y = 8.5$

d) i) Slope:  $-\frac{1}{3}$ ;  $y$ -intercept:  $-2$

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

iii)  $y = -\frac{16}{3}$ , or  $-5\frac{1}{3}$

13. a) Slope:  $-80$ ; the plane is descending at a speed of 80 m/min.  $h$ -intercept: 900; when the plane begins its descent, it is 900 m above the lake.

b)  $h = -80t + 900$

c) 460 m

d) i) The graph would be a line joining  $(0, 700)$  and  $(8, 0)$ .

ii)  $h = -87.5t + 700$

14. a)  $C = 0.80n + 20$

b) \$107.20

c) 125 songs

16. a)  $E = 0.05t + 34$

b) \$54

c) \$600

17. a)  $y = 4x + 1$

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

c)  $y = -\frac{5}{3}x - 7$

18. a) Graph C

b) Graph A

c) Graph D

d) Graph B

19. a) Graph C

b) Graph D

c) Graph B

d) Graph A

20. a) Graph B

b) Graph C

c) Graph D

d) Graph A

21. Parallel lines:

$y = -5x - 7$  and  $y = -5x + 13$ ;

$y = 5x + 15$  and  $y = 5x + 24$ ;

$y = \frac{1}{5}x + 9$  and  $y = \frac{1}{5}x + 21$ ;

$y = -\frac{1}{5}x + 15$  and  $y = -\frac{1}{5}x$

Perpendicular lines:

$y = -5x - 7$  and  $y = \frac{1}{5}x + 9$ ;

$y = -5x - 7$  and  $y = \frac{1}{5}x + 21$ ;

$y = -5x + 13$  and  $y = \frac{1}{5}x + 9$ ;

$y = -5x + 13$  and  $y = \frac{1}{5}x + 21$ ;

$y = 5x + 15$  and  $y = -\frac{1}{5}x + 15$ ;

$y = 5x + 15$  and  $y = -\frac{1}{5}x$ ;

$y = 5x + 24$  and  $y = -\frac{1}{5}x + 15$ ;

$y = 5x + 24$  and  $y = -\frac{1}{5}x$

22.  $y = -\frac{4}{3}x + 4$

23.  $c = -\frac{38}{3}$ , or  $-12\frac{2}{3}$

24.  $m = -\frac{47}{24}$ , or  $-1\frac{23}{24}$

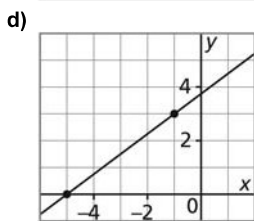
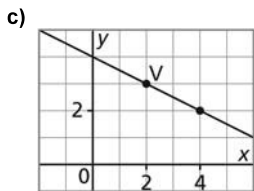
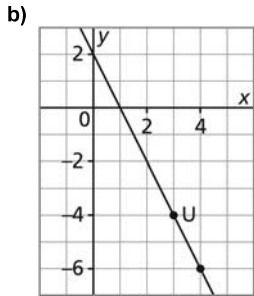
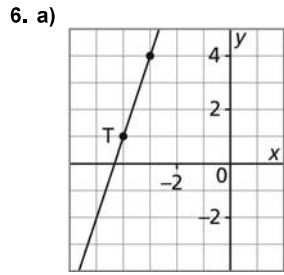


**6.5 Slope-Point Form of the Equation for a Linear Function, page 372**

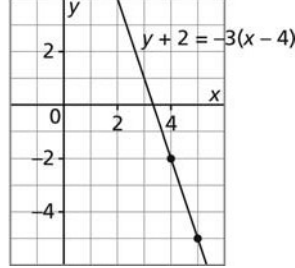
4. Coordinates may vary. For example:

- a) Slope:  $-4$ ;  $(1, 5)$
- b) Slope:  $3$ ;  $(8, -7)$
- c) Slope:  $1$ ;  $(-15, -11)$
- d) Slope:  $5$ ;  $(2, 0)$
- e) Slope:  $\frac{4}{7}$ ;  $(-3, -6)$
- f) Slope:  $-\frac{8}{5}$ ;  $(-16, 21)$

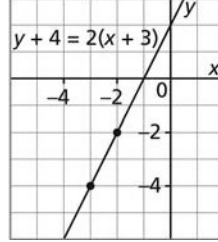
- 5. a)  $y - 2 = -5(x + 4)$
- b)  $y + 8 = 7(x - 6)$
- c)  $y + 5 = -\frac{3}{4}(x - 7)$
- d)  $y + 8 = 0$ , or  $y = -8$



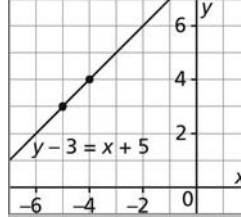
7. a) The graph is a line through  $(4, -2)$  with slope  $-3$ .



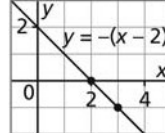
b) The graph is a line through  $(-3, -4)$  with slope  $2$ .



c) The graph is a line through  $(-5, 3)$  with slope  $1$ .



d) The graph is a line through  $(2, 0)$  with slope  $-1$ .



9. Equations may be written in different forms.

- a) i)  $y - 4 = -\frac{4}{3}(x + 2)$     ii)  $y - 3 = \frac{2}{5}(x - 3)$
- iii)  $y + 2 = \frac{1}{3}(x + 4)$     iv)  $y + 2 = -\frac{5}{2}(x - 1)$
- b) i)  $y = -\frac{4}{3}x + \frac{4}{3}$ ; x-intercept:  $1$ ; y-intercept:  $\frac{4}{3}$
- ii)  $y = \frac{2}{5}x + \frac{9}{5}$ ; x-intercept:  $-\frac{9}{2}$ , or  $-4.5$ ;  
y-intercept:  $\frac{9}{5}$
- iii)  $y = \frac{1}{3}x - \frac{2}{3}$ ; x-intercept:  $2$ ; y-intercept:  $-\frac{2}{3}$
- iv)  $y = -\frac{5}{2}x + \frac{1}{2}$ ; x-intercept:  $\frac{1}{5}$ , or  $0.2$ ;  
y-intercept:  $\frac{1}{2}$ , or  $0.5$

10. Different variables may be used.

a) Let  $s$  represent the speed of sound and  $t$  represent the air temperature:  $s - 337 = 0.6(t - 10)$

b) 331 m/s

11. Slope-point forms of equations may vary. For example:

a)  $y - 1 = 2(x - 1)$ , or  $y + 5 = 2(x + 2)$ ;  $y = 2x - 1$

b)  $y + 2 = -(x - 5)$ , or  $y - 7 = -(x + 4)$ ;  $y = -x + 3$

c)  $y - 8 = 3(x - 2)$ , or  $y + 7 = 3(x + 3)$ ;  $y = 3x + 2$

d)  $y + 5 = -2(x + 5)$ , or  $y + 1 = -2(x + 7)$ ;  
 $y = -2x - 15$

12. a) Graph C: slope 2 and  $y$ -intercept  $-5$

b) Graph A: slope 1 and  $y$ -intercept 1

c) Graph B: slope 2 and  $y$ -intercept 5

d) Graph D: slope  $-1$  and  $y$ -intercept  $-5$

13. The graphs are parallel. The graph of  $y - y_1 = m(x - x_1)$

passes through the point  $P(x_1, y_1)$ , and the graph of

$y + y_1 = m(x + x_1)$  passes through the point

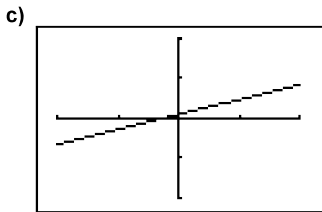
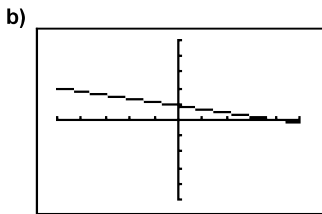
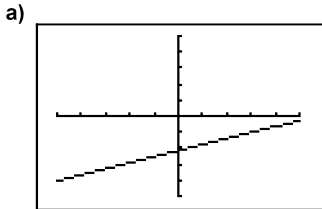
$Q(-x_1, -y_1)$ .

14. a)  $y - 2 = 2(x + 1)$

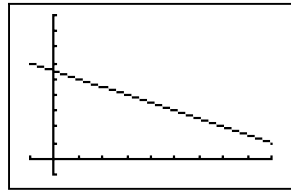
b)  $y - 2 = \frac{1}{3}(x - 1)$

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

15. Graphs may also be produced on a computer with graphing software. Graphs may show different windows.



d)



16. a) 1.26 g/mL; For every 1 mL of liquid that is poured into the cylinder, the mass of the cylinder and the liquid increases by 1.26 g.

b) Variables and form of the equation may vary.

For example: Let  $v$  millilitres represent the volume of the liquid, and  $M$  grams represent the mass of the cylinder and liquid;  $M - 51.5 = 1.26(v - 20)$

c) 64.1 g

d) 26.3 g

17. a) Variables and form of the equation may vary.

For example: Let  $M$  represent the mass of potash in millions of tonnes, and  $t$  represent the time in years since 2005;  $M = 0.6t + 8.2$

b) 11.2 million tonnes; 14.2 million tonnes;

Assumption: I assume that the relation continues for times beyond 2007 and remains linear.

18. a) Variables and form of the equation may vary. For

example: Let  $p$  represent the number of students enrolled in francophone schools, and  $t$  represent the time, in years, since 2001;  $p - 3470 = 198(t - 2)$

b) Approximately 3866 students

19. a)  $-2$  b)  $y - 11 = -2(x + 3)$

c)  $y + 3 = -2(x - 4)$

20. a) i)  $y + 3 = -\frac{4}{3}(x + 5)$

ii)  $y + 3 = \frac{3}{4}(x + 5)$

21. a)  $y + 2 = 2(x - 1)$  b)  $y + 2 = -\frac{1}{2}(x - 1)$

22. a)  $y - 6 = -\frac{5}{2}(x - 2)$  b)  $y - 6 = \frac{2}{5}(x - 2)$

23. a)  $y = \frac{3}{5}(x - 4)$

b)  $y + 1 = -\frac{1}{2}(x - 4)$

24. Form of the equation may vary.

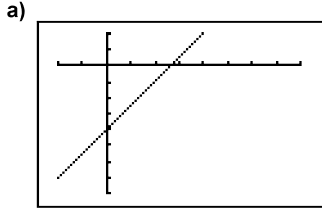
$$y = -\frac{9}{2}x + \frac{37}{9}$$

25. Form of the equation may vary.

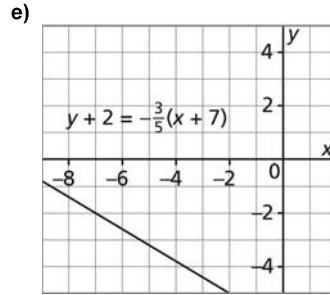
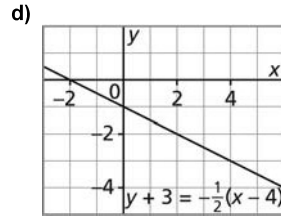
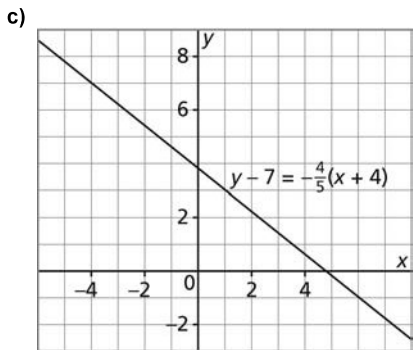
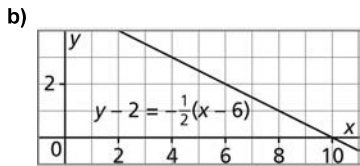
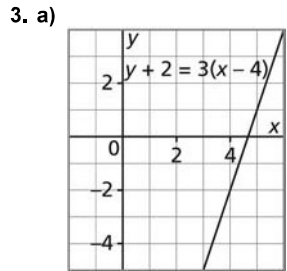
$$y + 5 = \frac{3}{5}(x + 2)$$

**Chapter 6: Checkpoint 2, page 376**

1. Screens may vary.



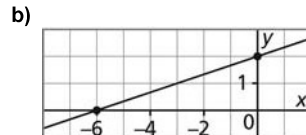
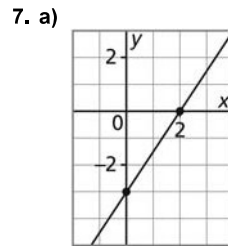
- b) Increase the value of  $m$  to get a line with a greater slope. Decrease the value of  $m$  to get a line with a lesser slope.
- c) Increase the value of  $b$  to get a line with a greater  $y$ -intercept. Decrease the value of  $b$  to get a line with a lesser  $y$ -intercept.
2. a) Slope: 25;  $d$ -intercept: 10; 25 km/h is Eric's average speed;  $d$ -intercept: 10 km is Eric's distance from home at the start of his ride.
- b)  $d = 25t + 10$
- c) i) 66.25 km  
ii) 1.4 h, or 1 h 24 min



4. a)  $y = 2x + 3$
- b) Equations may have different forms. For example:  
 $y - 5 = 2(x - 1)$

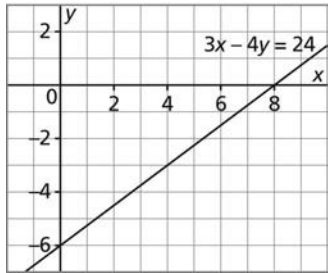
**6.6 General Form of the Equation for a Linear Relation, page 384**

4. a) Standard form  
b) General form  
c) Slope-intercept form  
d) Slope-point form
5. a)  $x$ -intercept: 3;  $y$ -intercept:  $-8$   
b)  $x$ -intercept: 8;  $y$ -intercept: 7  
c)  $x$ -intercept: 22;  $y$ -intercept:  $-8$   
d)  $x$ -intercept: 13.5;  $y$ -intercept:  $-3$
6. a)  $4x + 3y - 36 = 0$   
b)  $2x - y - 7 = 0$   
c)  $2x + y - 6 = 0$   
d)  $5x - y - 1 = 0$

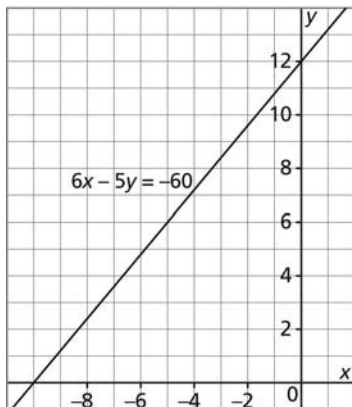


8. a) i) The coefficient of  $x$  is negative.  
 ii) Neither side of the equation is 0.  
 iii) The coefficient of  $x$  is not a whole number.  
 iv) The  $x$ -term should come before the  $y$ -term.  
 b) i)  $2x - 3y - 42 = 0$   
 ii)  $5x - 4y + 100 = 0$   
 iii)  $x - y + 2 = 0$   
 iv)  $9x + 5y - 20 = 0$

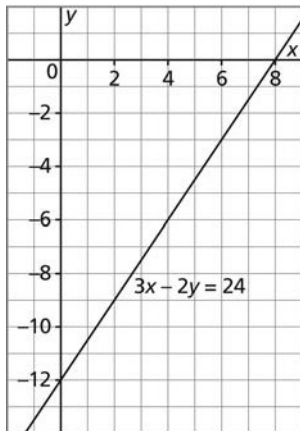
9. a) i)  $x$ -intercept: 8;  $y$ -intercept:  $-6$   
 ii)



- b) i)  $x$ -intercept:  $-10$ ;  $y$ -intercept: 12  
 ii)

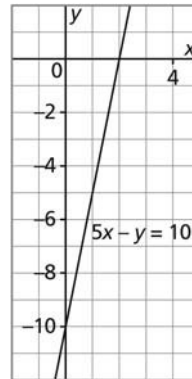


- c) i)  $x$ -intercept: 8;  $y$ -intercept:  $-12$   
 ii)

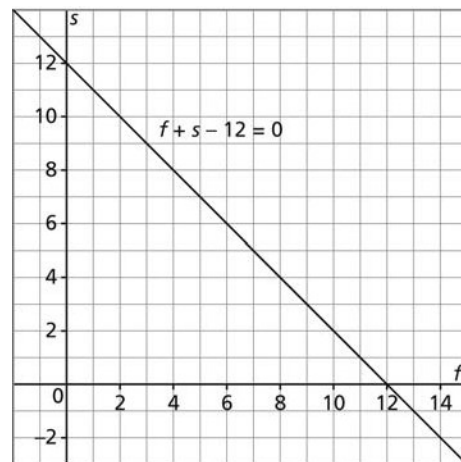


- d) i)  $x$ -intercept: 2;  $y$ -intercept:  $-10$

ii)



10. b)



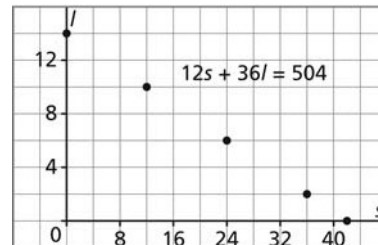
c)  $f + s - 12 = 0$

- d) Pairs of integers may vary. For example:  
 0 and 12; 5 and 7; 3 and 9; 13 and  $-1$ ; 14 and  $-2$ ;  
 15 and  $-3$

11. a), b) Letters for the variables may differ.

Let  $s$  represent a small pan, and  $l$  represent a large pan.

$$12s + 36l = 504$$



12. a)  $y = -\frac{4}{3}x + 8$

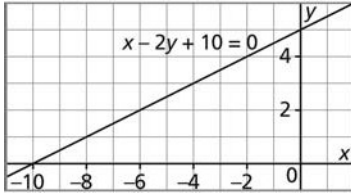
b)  $y = \frac{3}{8}x + \frac{3}{2}$

c)  $y = \frac{2}{5}x - 3$

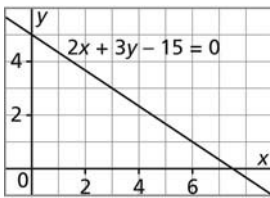
d)  $y = -\frac{7}{3}x - \frac{10}{3}$

13. a) -4  
 b) 3  
 c) 5  
 d) -5

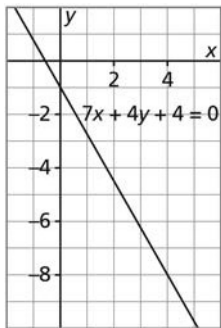
14. a)



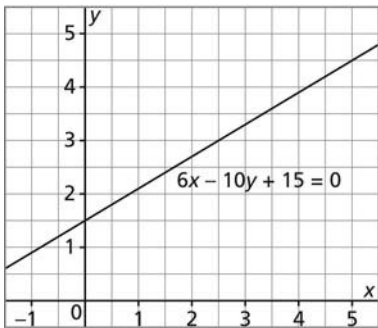
b)



c)



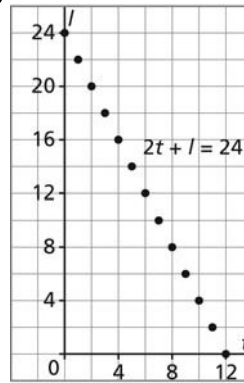
d)



15. a) 9 pieces of 8-ft. pipe  
 b) 12 pieces of 6-ft. pipe  
 c) No; 9.75 pieces of 8-ft. pipe would be needed  
 d) No;  $10\frac{2}{3}$  pieces of 6-ft. pipe would be needed

16. Graphs may have variables on different axes; and variables may be different. Let  $l$  represent the number of loonies and  $t$  represent the number of toonies.

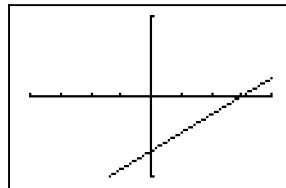
b), c)  $2t + l = 24$



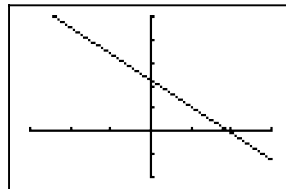
- d) i) No  
 ii) No

17. Screens may vary.

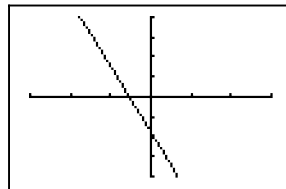
a)



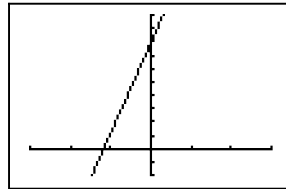
b)



c)



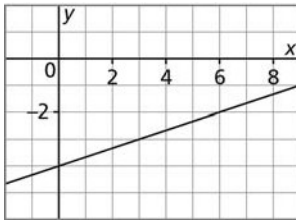
d)



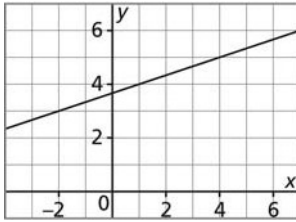
18. a)  $x - 3y - 12 = 0$   
 b)  $x - 3y + 11 = 0$   
 c)  $x + 4y + 11 = 0$   
 d)  $9x + 6y - 8 = 0$

19. Forms of the equations may vary. For example:

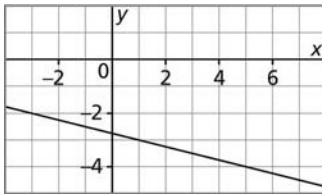
a)  $y = \frac{1}{3}x - 4$ ;  $x - 3y - 12 = 0$ ;  $y + 3 = \frac{1}{3}(x - 3)$



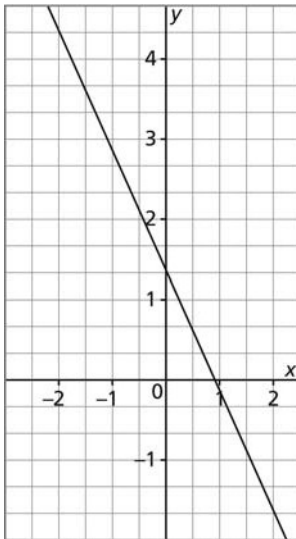
b)  $y - 2 = \frac{1}{3}(x + 5)$ ;  $x - 3y + 11 = 0$ ;  $y = \frac{1}{3}x + \frac{11}{3}$



c)  $y + 3 = -\frac{1}{4}(x - 1)$ ;  $x + 4y + 11 = 0$ ;  $y = -\frac{1}{4}x - \frac{11}{4}$

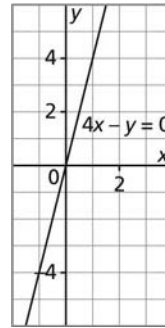


d)  $y = -\frac{3}{2}x + \frac{4}{3}$ ;  $9x + 6y - 8 = 0$ ;  $y + \frac{1}{6} = -\frac{3}{2}(x - 1)$



22. a) Graph B  
b) Graph A

23. b)



24. Equations in parts b, e, and g are equivalent.

Equations in parts d, f, and h are equivalent.

26. a)  $3x + 4y - 12 = 0$ ; linear function  
b) Not a linear function  
c) Not a linear function  
d)  $x - 3y + 8 = 0$ ; linear function

28. a)  $B \neq 0$ :  $-\frac{A}{B}$   
b)  $B \neq 0$ :  $-\frac{C}{B}$

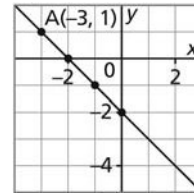
### Chapter 6: Review, page 388

1. a)  $-\frac{2}{3}$   
b)  $\frac{4}{5}$

2. a) Negative  
b) Negative  
c) Zero

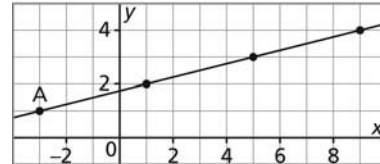
3. Sketches and coordinates may vary.

a) i)



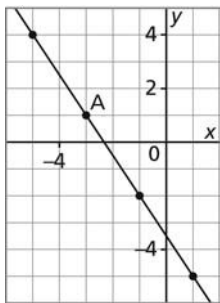
ii)  $(-2, 0)$ ,  $(-1, -1)$ ,  $(0, -2)$

b) i)



ii)  $(1, 2)$ ,  $(5, 3)$ ,  $(9, 4)$

c) i)



ii)  $(-5, 4), (-1, -2), (1, -5)$

4. a)  $-2$

b)  $-\frac{3}{2}$

5. a) 160; for every 1 min Gabrielle jogs, she covers a distance of 160 m.

b) Slope is equal to the rate of change.

c) i) 640 m

ii) 6.25 min, or 6 min 15 s

6. a) i) 3                      ii)  $-\frac{1}{3}$

b) i)  $-\frac{6}{5}$                     ii)  $\frac{5}{6}$

c) i)  $\frac{11}{8}$                       ii)  $-\frac{8}{11}$

d) i) 1                        ii)  $-1$

7. a) Perpendicular; slope of JH: 2; slope of KM:  $-\frac{1}{2}$

b) Neither; slope of NP: 3; slope of QR:  $-3$

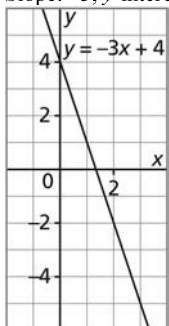
8. No; slope of ST:  $-\frac{1}{3}$ ; slope of TU: 3; slope of UV:  $-\frac{4}{9}$ ;

slope of SV:  $\frac{5}{2}$

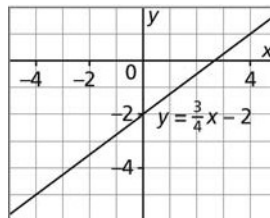
9. Yes; The slopes of AB and BC are negative reciprocals, so AB and BC are perpendicular.

Slope of AB: 2; slope of BC:  $-\frac{1}{2}$

11. a) Slope:  $-3$ ;  $y$ -intercept: 4



b) Slope:  $\frac{3}{4}$ ;  $y$ -intercept:  $-2$



12. a) i) Slope:  $\frac{5}{3}$ ;  $y$ -intercept: 1

ii)  $y = \frac{5}{3}x + 1$

b) i) Slope:  $-\frac{3}{2}$ ;  $y$ -intercept:  $-1$

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

13. a) Graph C

b) Graph D

c) Graph A

d) Graph B

14. a)  $A = 15w + 40$

b) 21 weeks

c) The slope would represent the amount Mason saved each week: \$15; the vertical intercept would represent the amount in his bank account when he started saving: \$40

15. Equations may vary. For example:

a)  $y = \frac{4}{7}x + 1$  and  $y = \frac{4}{7}x - 10$

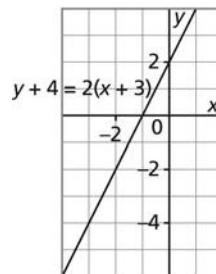
b)  $y = -\frac{7}{4}x + 1$  and  $y = -\frac{7}{4}x - 10$

16.  $y - 3 = -\frac{1}{2}(x + 2)$

17. Coordinates and forms of the equation may vary.

a) i) 2;  $(-3, -4)$

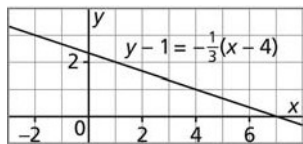
ii)



iii)  $y + 2 = 2(x + 2)$

b) i)  $-\frac{1}{3}$ ;  $(4, 1)$

ii)



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

18. Forms of the equation may vary. For example:

a)  $y = \frac{2}{3}(x - 2)$

b)  $y - 2 = -\frac{3}{5}(x + 3)$

19. Forms of the equation may vary.

a) i)  $y - 5 = 3(x - 1)$  or  $y + 7 = 3(x + 3)$

ii)  $y + 1 = -\frac{1}{2}(x - 5)$  or  $y - 3 = -\frac{1}{2}(x + 3)$

b) Coordinates may vary. For example:

i) (2, 8)

ii) (1, 1)

20. Variables may differ. For example:

a) Let  $C$  represent the cost, and  $p$  represent the number of people:  $C = 44p$

b) \$44

c) 6 people

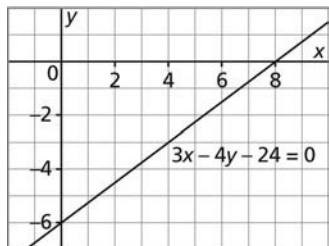
21. b) i)  $5x - 4y + 40 = 0$

ii)  $x + 3y - 12 = 0$

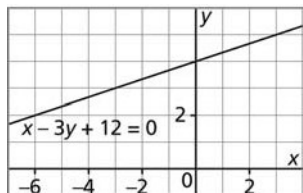
iii)  $x - 3y + 10 = 0$

iv)  $x - 5y + 15 = 0$

22. a) i)



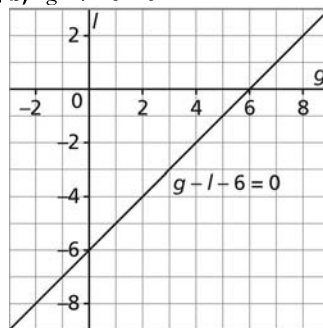
ii)



b) i)  $\frac{3}{4}$

ii)  $\frac{1}{3}$

24. a), b)  $g - l - 6 = 0$



c) Pairs of integers may vary. For example:

8 and 2; 7 and 1; 6 and 0; 5 and -1; 4 and -2

25. Equations in parts a and d are equivalent. Equations in parts b and e are equivalent.

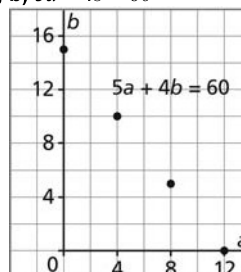
26. a) Graph B

b) Graph C

c) Graph A

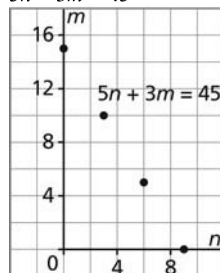
27. Variables may differ. Let  $a$  represent the number of hours Max babysits for the first family, and  $b$  represent the number of hours he babysits for the second family.

a), b)  $5a + 4b = 60$



28. Variables may differ. Let  $n$  represent the number of new releases and  $m$  represent the number of old movies Kylie rents:

a)  $5n + 3m = 45$



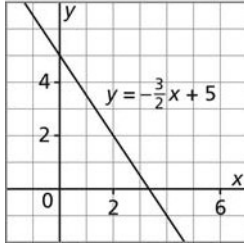
b) i) No

ii) Yes

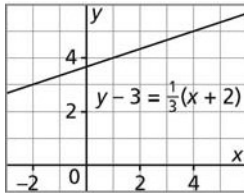


**Chapter 6: Practice Test, page 391**

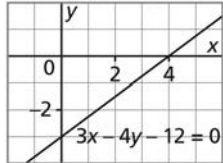
- 1. C
- 2. B
- 3. a) i)



ii)



iii)



- b)  $y - 2 = -\frac{3}{2}(x - 6)$
- c)  $3x + y + 1 = 0$
- d) Coordinates and equations may vary. For example:  
P(8, 3) and  $y = -\frac{2}{7}x + \frac{37}{7}$

- 4. Answers and forms of equations may vary. For example:
  - a) Slope-intercept form:  $y = -2x - 2$
  - b) General form:  $y + 1 = 0$
  - c) Slope-point form:  $y - 1 = \frac{3}{4}(x - 3)$
- 5. a) \$6570
- b) 520 people

**Chapter 7 Systems of Linear Equations**

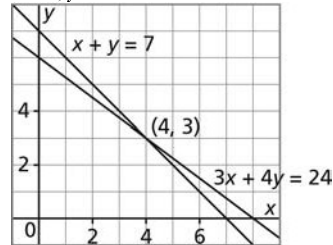
**7.1 Developing Systems of Linear Equations, page 401**

- 4. d
- 5. c
- 6. a) iii; x dollars represents the cost of a jacket and y dollars represents the cost of a sweater.
- b) i; x represents the length in feet and y represents the width in feet.
- c) ii; x represents the number of chapatti breads sold and y represents the number of naan breads sold.

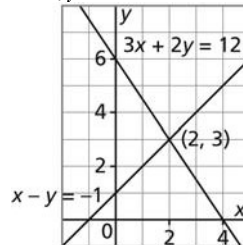
- 7. Variables may differ.
  - a)  $2s + 2l = 20$  and  $s + 3l = 22$
- 8. Variables may differ.
  - a)  $2l + s = 24$  and  $l - s = 6$
- 9. a)  $3x + y = 17$  and  $x = y + 3$
- 10.  $x + 2y = 20$  and  $x + y = 13$ ; Solution B
- 11. Variables may differ.
  - $w + j = 60$  and  $w - j = 10$ ; Solution A
- 15. a)  $\frac{C}{B} = \frac{F}{E}$
- b)  $\frac{C}{A} = \frac{F}{D}$
- 16.  $x + 2y = -8$  and  $9x + 10y = 0$
- 17. a) For example,  $3x + 2y = 5$  and  $-2x + 3y = 1$
- 18. b)  $x = 3$

**7.2 Solving a System of Linear Equations Graphically, page 409**

- 3. a)  $x = -4, y = 2$
- b)  $x = 2, y = 3$
- c)  $x = 1, y = -3$
- d)  $x = -2, y = -1$
- 4. a)  $x = 9, y = -2$ ; exact
- b)  $x = -1\frac{3}{4}, y = 2\frac{3}{4}$ ; approximate
- 5. a) i)  $x = 4, y = 3$



ii)  $x = 2, y = 3$



iii)  $x = 6, y = -5$

