

$$\begin{array}{llll} \text{m)} & 2x + 3y = 7 & \text{n)} & y = \frac{1}{2}x + 3 \\ & 2x - 3y = 13 & & x = 2y - 6 \\ \text{o)} & 2x - 3y = 4 & & 3x - 4y = 5 \\ \text{p)} & 3x + 2y - 10 = 0 & & 2x - 3y + 2 = 5 \end{array}$$

4. Solve by graphing. Check each solution.

$$\begin{array}{llll} \text{a)} & y = 4x & \text{b)} & 2x - 2y - 1 = 0 \\ & y = 2x + 1 & \text{c)} & x + 2y = 0 \\ & & & x - 2y = -2 \\ \text{d)} & x + y = -1 & & 3x - y = 7 \end{array}$$

5. Solve by graphing.

$$\begin{array}{lll} \text{a)} & 3x + 2y = 3 & \text{b)} & x + 2y = 10 \\ & 2x + 10y = -5 & & x - y = 5 \\ \text{c)} & 2x + 3y - 7 = 0 & & 3x - 5y - 13 = 0 \\ \text{d)} & y = -0.5x - 1 & \text{e)} & y = 3 \\ & y = 0.25x + 1 & & y = 2.58x - 3 \\ \text{f)} & y = 0.35x + 6.02 & & y = -3.22x - 3.12 \end{array}$$

6. Without graphing, determine whether each system has one solution, no solution, or infinitely many solutions.

$$\begin{array}{lll} \text{a)} & 2x + y = 5 & \text{b)} & 3x - y = 0 \\ & 4x + y = 9 & & 6x - 2y = 3 \\ \text{c)} & x + y = 2 & & 3x = 6 - 3y \\ \text{d)} & x + 4y = 8 & \text{e)} & 2y = 3x - 1 \\ & y + 2x = 0 & & 8y - 4 = 12x \\ \text{f)} & 2y - x - 4 = 0 & & 3x - 6y - 12 = 0 \end{array}$$

Applications and Problem Solving

7. **Geography** The total number of states in Austria and Germany is 25. Germany has 7 more states than Austria. Solve the following system of equations graphically to find the number of states in each country.

$$\begin{array}{l} a + g = 25 \\ g = a + 7 \end{array}$$

B

8. **Health clubs** Phoenix Health Club charges a \$200 initiation fee, plus \$15 a month. Champion Health Club charges a \$100 initiation fee, plus \$20 a month. The costs can be compared using the following equations.

$$\text{Phoenix Cost: } C = 200 + 15m$$

$$\text{Champion Cost: } C = 100 + 20m$$

- Find the point of intersection of the two lines.
- After how many months are the costs the same?
- If you joined a club for only a year, which club would be less expensive?

9. **Coordinate geometry** The arms of an angle lie on the lines $y = \frac{2}{3}x + 7$ and $3x + 2y = -12$. What are the coordinates of the vertex of the angle?

10. **Coordinate geometry** The three lines $y = 2x$, $y = 6 - x$, and $y = -2$ intersect to form a triangle. What are the coordinates of the vertices of the triangle?

11. **Coordinate geometry** The three lines $y = \frac{1}{3}x - 2$, $x - y = 4$, and $x + 3y = 4$ intersect to form a triangle. Find the coordinates of the vertices.

Answers

Chapter 1

Getting Started p. 2

1. 10; The check digit will be 0. **2. a)** 9 **b)** 9 **c)** 2 **d)** 8 **3. a)** No, the check digit should be 6. **b)** Yes, the check digit is correct. **c)** Yes, the check digit is correct. **4.** Answers may vary. 123 456 717; 223 456 740 **5. a)** $10 - m$ **b)** 0 **c)** The check digit is equal to $10 - m$ if $m \neq 0$ and 0 if $m = 0$.

Review of Prerequisite Skills p. 3

1. **a)** $x + 2$ **b)** $2x + 8$ **c)** $3y - 5$ **d)** $-5a + 3$ **e)** $6x + 14$
f) $5z - 8$ **g)** $7t + 41$ **h)** $2x - 9$ **2. a)** $6x$ **b)** $-2c$ **c)** x
d) $3n$ **e)** $x + 2y$ **f)** $3p - r$ **3. a)** 8 **b)** 2 **c)** -6 **d)** -5
4. a) 7 **b)** -3 **c)** 2 **d)** 12 **e)** $-\frac{1}{2}$ **f)** $\frac{3}{2}$ **g)** 4 **h)** -5 **i)** $-\frac{5}{2}$
j) -4 **k)** -1 **l)** 2 **5. a)** $x = 11 - 3y$ **b)** $x = 5y - 8$
c) $x = 2y - 4$ **d)** $x = \frac{5-3y}{2}$ **6. a)** $y = 3 - 2x$
b) $y = x - 2$ **c)** $y = \frac{-1-2x}{4}$ **d)** $y = \frac{3x-4}{2}$
10. a) (3, 1) **b)** (5, -2) **c)** (-1, 6) **d)** (4, 8) **e)** (-4, -5)
f) (2, -1) **11. a)** $9x - 4y + 1$ **b)** $13m^2 - 6m - 19$
c) $-a - 3b - 10$ **d)** $-e - 2$ **12. a)** $x - 8y + 10$
b) $-t^2 - 5t - 11$ **c)** $-9a + 3b + 1$ **d)** $12e - 1$

Section 1.1 pp. 4-5

- 1 Ordered Pairs and One Equation** **1. a)** (1, 13), (24, -10) **b)** (-2, -4), (-12, 0) **c)** (2, 3) **d)** (0.5, -2.5)
2. a) 3, 9, 10, -2 **b)** 2, -9, 11, -2 **c)** -1, 5, 13, 10
d) 5, 3, -4, -7
2 Ordered Pairs and Two Equations **1. a)** (1, 2)
b) (-3, 1) **c)** (2, 3) **d)** (6, -8) **e)** (-2, -5) **f)** (-4, 7)
2. a) (4, -3) **b)** (6, 3) **c)** (-1, 0) **d)** Answers may vary. (0, 0)
3 Problem Solving **1. a)** 55 **b)** 3 days **c)** \$55
2. a) The equations represent the same graph.
b) Answers may vary. (-1, 2), (-2, 3) **3.** The equations represent parallel and distinct lines. The lines never intersect.

Section 1.2 pp. 12-14

- Practice** **1. a)** (5, 4) **b)** (-1, 2) **c)** (-3, -5) **d)** (2, -3)
2. a) (-2, 3) **b)** (2, 0) **c)** (2, -3) **d)** (-3, -2)
3. a) (3, -1) **b)** (-1, 6) **c)** (4, -1) **d)** infinitely many solutions **e)** (6, 0) **f)** (-3, 4) **g)** no solution
h) (-2, -1) **i)** (2, -1) **j)** (-3, -2) **k)** (4, 1) **l)** no solution **m)** (5, -1) **n)** infinitely many solutions
o) (-1, -2) **p)** (2, 2) **4. a)** (0.5, 2) **b)** (2, 1.5)
c) (-1, 0.5) **d)** (1.5, -2.5) **5. a)** (1.5, -0.8)
b) (6.7, 1.7) **c)** (3.9, -0.3) **d)** (-2.7, 0.3) **e)** (2.3, 3)
f) (-2.6, 5.1) **6. a)** one solution **b)** no solution
c) infinitely many solutions **d)** one solution **e)** no solution **f)** no solution **7.** Austria: 9, Germany: 16
8. a) (20, 500) **b)** 20 months **c)** Champion **9.** (-6, 3)
10. (2, 4), (-1, -2), (8, -2) **11.** (3, -1), (5, $-\frac{1}{3}$), (4, 0)

12. parallelogram 13. Answers may vary.

- a)** $x + y = 5$ **b)** $2x + 2y = 8$ **c)** $x + 2y = 4$ **14.** Answers may vary. **a)** $x + y = 5$, $x - y = 1$ **b)** $x - y = 1$, $2x - 2y = 2$ **15.** The system has infinitely many solutions: all points on the line $x - 2y + 6 = 0$.
17. a) (-12.5, 9); (48, 24); (-16, -18)

Modelling Math p. 14

- a)** (t, d) = (50, 1000) **b)** 50 **c)** less than 50
d) greater than 50

Career Connection p. 15

- 1.** south: 5000, north: 125 000

Section 1.3 pp. 21-23

- Practice** **1. a)** $x = 8 - 3y$ **b)** $x = -4y - 13$
c) $x = 7y + 7$ **d)** $x = 2y - 1$ **2. a)** $y = 11 - 6x$
b) $y = -5x - 9$ **c)** $y = x + 2$ **d)** $y = 3x + 4$ **3. a)** (2, 2)
b) (-1, 1) **c)** (2, -1) **d)** (-2, -3) **e)** (3, 0) **f)** (3, 2)
g) (4, -5) **h)** (5, 0) **i)** (-2, 3) **j)** (-2, -2) **k)** (-1, 1)
l) (-3, -4) **m)** (1, 0) **n)** (1, 3) **o)** no solution **p)** (3, -1)
q) infinitely many solutions **r)** (-1, -5)
s) no solution **t)** (1, 1) **u)** (-1, 1) **4. a)** $(\frac{1}{2}, -1)$
b) $(\frac{7}{11}, -\frac{1}{11})$ **c)** $(3, -\frac{6}{5})$ **d)** $(1, -\frac{1}{3})$ **e)** $(-1, \frac{2}{7})$