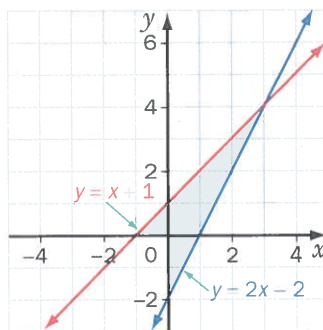


Key CONCEPTS

- 1** To solve a system of linear equations graphically,
 - a) graph the equations using a graphing calculator, graphing software, or paper and pencil
 - b) determine the coordinates of the point of intersection
 - c) check the solution by substituting it in each of the original equations
- 2** The number of solutions to a linear system is
 - a) exactly one, if the lines intersect
 - b) none, if the lines are parallel and distinct
 - c) infinitely many, if the lines coincide

Communicate Your Understanding

- 1.** The linear system $y = x + 1$ and $y = 2x - 2$ is modelled graphically at the right. State the solution to this system. Justify your answer.
- 2.** Describe how you would solve the linear system $2x + 3y = 3$ and $3x - y = 7$ graphically.
- 3.** Explain why a system of linear equations cannot have exactly two solutions.
- 4.** Decide how many solutions there are to the following linear system just by looking at the equations. Explain your reasoning.



$$y = 7x - 4$$

$$y = 7x + 5$$

Practice

A

- 1.** Solve each system by graphing. Check your solutions.

a) $y = x - 1$ $y = 9 - x$	b) $y = x + 3$ $y = 1 - x$	c) $y = 2x + 1$ $y = x - 2$	d) $y = 1 - 2x$ $y = x - 5$
-------------------------------	-------------------------------	--------------------------------	--------------------------------
- 2.** Solve each system by graphing. Check your solutions.

a) $x - y = -5$ $x + y = 1$	b) $5x - 2y = 10$ $x + 2y = 2$	c) $3x - 2y = 12$ $x - 2y = 8$	d) $2x + 3y = -12$ $2x - y = -4$
--------------------------------	-----------------------------------	-----------------------------------	-------------------------------------
- 3.** Solve each system by graphing. Check your solutions.

a) $x - y = 4$ $x + y = 2$	b) $x + y = 5$ $x - y = -7$	c) $x + 2y = 2$ $x + y = 3$	d) $x + 3y = -1$ $2x + 6y + 2 = 0$
e) $2x + y = 12$ $3x - 2y = 18$	f) $2x + y = -2$ $4x = y - 16$	g) $y = 2x - 3$ $2x - y = 5$	h) $2x + y = -5$ $3x - y = -5$
i) $2x - y = 5$ $y = x - 3$	j) $3x + y = -11$ $y = 2x + 4$	k) $3x + 4y - 16 = 0$ $x - 2y - 2 = 0$	l) $3x = y + 8$ $6x - 2y - 1 = 0$

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)** $(-1, \frac{2}{7})$