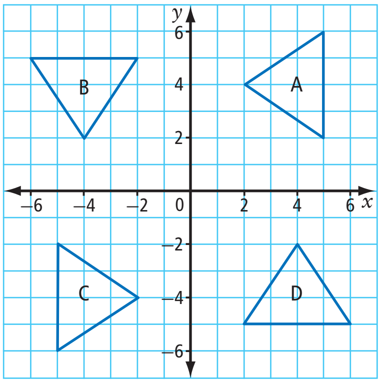
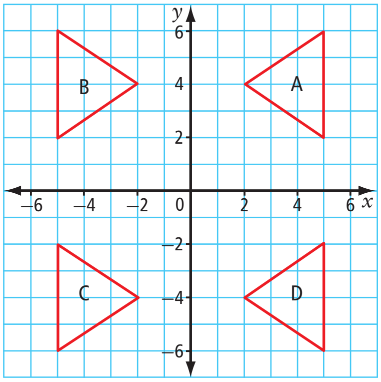
5. a)



b)



6. a) 11 250 cm² **b)** 10 000 cm², a decrease in surface area of 1250 cm²

7. $-2\frac{3}{4}, -0.9, -\frac{4}{5}, -\frac{2}{3}, 0.\overline{6}, 2.7$

8. $-6\frac{7}{20}$

9. a) −1, −0.68 **b)** 4, 3.6 **c)** 4, 4.6 **d)** −1, −1.07 **e)** −2, −2.03 **f)** −20, −22.26 **g)** 4, 3.41 **h)** 1, 1

10. a) $2, 2\frac{1}{5}$ **b)** $-1\frac{1}{3}, -1\frac{1}{15}$ **c)** $-\frac{25}{12}, -\frac{19}{12}$ **d)** $-\frac{1}{3}, -\frac{7}{24}$ **e)** $-\frac{3}{70}, -\frac{3}{70}$ **f)** $\frac{5}{6}, \frac{5}{6}$ **g)** $-2, -1\frac{17}{18}$ **h)** $6, 6\frac{1}{4}$

11. a) 2 cm, 1.6 cm **b)** 0.1 km, 0.1 km **c)** 0.2 mm, 0.22 mm **d)** 1 km, 1.01 km

12. 6.8 m

13. 4^{17}

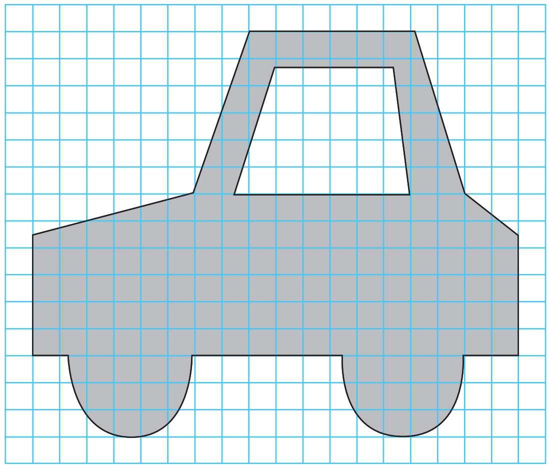
14. 3

15. $(-4)^9$, −262 144

16. $21 \times 21 \times 21 \times 21$, $3^4 \times 7^4$

17. a) 1600 **b)** 25 600

18.



19. a) 12 **b)** 18.5 **c)** 0.414

20. $x = 1$

21. 647 km; assuming the distance on the diagram measures 4.2 cm

22. Rectangles B and D and rectangles A and F are similar.

23. a) hexagons, triangles, heptagons **b)** The hexagons are similar, the triangles are similar, and the heptagons are similar. Example: Each triangle shares two edges with hexagons and one edge with a heptagon. The similar shapes decrease in size with distance from the centre.

Chapter 5

5.1 The Language of Mathematics, pages 179–182

5. a) 3, trinomial **b)** 1, monomial **c)** 4, polynomial **d)** 1, monomial

6. a) 1, monomial **b)** 3, trinomial **c)** 1, monomial **d)** 2, binomial

7. a) $6x$ and -15 **b)** $7 + a + b$ **c)** $3x - y$ and $4c^2 - cd$

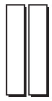
8. a) degree 1, 2 terms **b)** degree 2, 2 terms **c)** degree 2, 3 terms

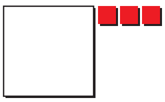
9. a) degree 2, 2 terms **b)** degree 2, 3 terms **c)** degree 0, 1 term

10. a) $2 + p$ and $2x^2 - y^2$ **b)** $3b^2$, $4st + t - 1$, and $2x^2 - y^2$ **c)** b **d)** $2 + p$ and $4st + t - 1$

11. a) $2x - 3$ **b)** $x^2 - 2x + 1$ **c)** $-x^2 + 3x - 2$

12. a) $2x^2 + 4$ **b)** $-x^2 - 2x - 4$ **c)** 4

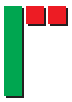
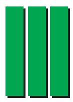
13. a)  **b)**  **c)** 

14. a) 

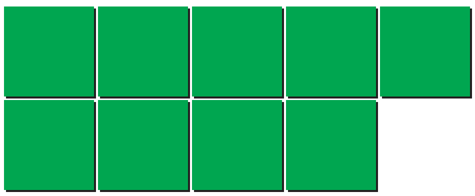
b) 

c) 

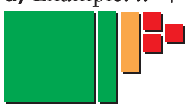
15. a) Example: $x + 2$ **b)** Example: $3x$

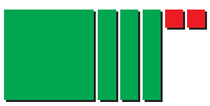
c) Example: $9x^2$



d) Example: $x^2 + x + y + 3$



16. a) Example: Both tiles share a common dimension of 1 unit. **b)** $x + 3$
17. a) $6x$ **b)** $2x + 3$ **c)** $x^2 + 4x$
18. Example: The expression $x^2 + 3x + 2$ is a trinomial of degree 2.



19. a) 2 **b)** 6 **c)** 1 **d)** 2 **e)** -5
20. a) $3x^2 - 2x + 1$
b) Example: $d^2 - 5d + 2$

21. a) $8 + x$, x represents the unknown number **b)** $x + 5$, x represents the amount of money **c)** $w + 4$, w represents the width of the page **d)** $5x + 2$, x represents the unknown number **e)** $3n - 21$, n represents the number of people
22. a) Example: The Riggers scored 5 more than triple the number of goals scored by the Raiders. **b)** Example: The number of coins remaining from a purse containing 10 coins after an unknown number of coins were removed
23. a) a represents the number of adults and c represents the number of children
b) \$215
c) $23a + 17c$
24. $10a + 5s$, where a represents the number of adults and s represents the number of students.
25. a) $2w + s$ **b)** w represents the number of wins and s represents the number of shoot-out losses **c)** 4
d) 28 **e)** Two possible records for Team B are: 8 wins, 12 shoot-out losses, and 0 losses in regulation time ($2 \times 8 + 12 = 28$); 10 wins, 8 shoot-out losses, and 2 losses in regulation time ($2 \times 10 + 8 = 28$).
26. a) binomial of degree 1 **b)** Example: 5 could be the charge per person, 75 could be the cost of renting the room. **c)** \$825
27. a) Example: $2c - w$, where c represents the number of correct answers and w represents the number of wrong answers. **b)** All 25 questions correct would result in a maximum score of 50 points. All 25 questions wrong would result in a minimum score of -25.
c)

Number Correct	Number Wrong	Number Unanswered	Score
20	5	0	35
20	4	1	36
20	3	2	37
20	2	3	38
20	1	4	39
20	0	5	40

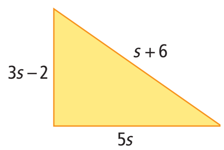
28. 2
29. a) $6x + 6$ **b)** $x + 3 = 2x$ **c)** $x + 3 = 2x$, subtract x from both sides, $3 = x$
30. Example: $xz + 4y + 3$
31. a) Example: $d = st$, where d represents distance, s represent speed, and t represents time.
b)

Part of Race	Distance (km)	Speed (km/h)	Time (h)
swim	d_1	1.3	$\frac{d_1}{1.3}$
cycle	d_2	28.0	$\frac{d_2}{28}$
run	d_3	12.0	$\frac{d_3}{12}$

c) $\frac{d_1}{1.3} + \frac{d_2}{28} + \frac{d_3}{12}$ **d)** 3.416 h, assuming that Deidra races at her average pace **e)** 12.868 h

5.2 Equivalent Expressions, pages 187–189

5. a) coefficient: -3; number of variables: 1
b) coefficient: 1; number of variables: 1
c) coefficient: 0; number of variables: 0
6. a) coefficient: 4; number of variables: 1
b) coefficient: -1; number of variables: 3
c) coefficient: -8; number of variables: 2
7. a) x^2 and xt **b)** $-ts$ and xt **c)** $3x$ and $4t$ **d)** $-ts$
8. a) $2a$ and $-7.1a$ **b)** $3m$ and $\frac{4}{3}m$
c) -1.9 and 5; $6p^2$ and p^2
9. a) $-2k$ and $104k$ **b)** $\frac{1}{2}ab$ and ab
c) -5 and 5; $13d^2$ and d^2
10. a) $-4x^2 + 4x$ **b)** $-3n - 1$ **c)** $-q^2 - q$ **d)** $c - 4$
e) $5h^2 - h$ **f)** $-j^2 + 5j - 6$
11. a) $-2d^2 - 3d$ **b)** $-y^2 + 3y$ **c)** $p^2 + p - 2$
d) $4m + 2$ **e)** $3q^2 - 4q$ **f)** $-3w^2 + 3w - 4$
12. B, C, and E
13. Example: Yes. 2 m and 1 m are expressed in the same unit of measurement, so they can be considered like terms. Their sum is 3 m. 32 cm and 63 cm are expressed in the same unit of measurement, so they can be considered like terms. Their sum is 95 cm.
14. a) Example: The amount of liquid in a can is reduced by 3 mL. **b)** Example: The number of coloured markers is 5 more than twice the number of pens.
15. a) Example: $p^2 + p^2 - 6p + 3p + 5 - 3$
b) Example: $10x^2 - 13x^2 + x + 4x - 10 + 6$
c) $r^2 + r^2 + 2r^2 - 7q^2 + 5q^2 - 3qr$
16. a) $10d + 3$ **b)** $4w + 18$
17. a)



b) $9s + 4$
18. a) $5n - 700$, where n represents the number of students **b)** \$550 **c)** Example: estimate: 150; actual: 141
19. a) $60n + 54$ **b)** \$174
c) $60n + 54 + \frac{60n + 54}{2}$; $90n + 81$
20. a) $3000 + 16b$ **b)** \$12 600 **c)** \$21 **d)** \$19
21. a) Raj combined $3x - 5x$ incorrectly; it should be $-2x$. He also combined $-8 + 9$ incorrectly; it should be 1.
b) $-2x + 1$
22. a) $x + 3x + 7 + 2x - 5$ **b)** $6x + 2$
23. When $y = w$. Example: Assign a value to x, such as $x = 10$. Substitute this value into the two expressions. The first expression becomes $y + 13$. The second expression becomes $w + 13$. If the two expression are equal, then $y = w$.

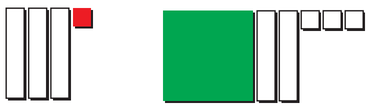
24. a)

Wholesale Price (\$)	Expression for Retail Price	Retail Price (\$)
8.00	$8 + (0.4)(8)$	11.20
12.00	$12 + (0.4)(12)$	16.80
30.00	$30 + (0.4)(30)$	42.00
x	$x + 0.4x$	$1.4x$

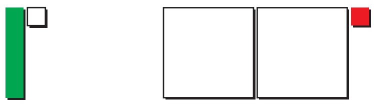
b) Example: $x + 10 + (0.4)(x + 10) = x + 10 + 0.4x + 4$
$= 1.4x + 14$
Or multiply 1.4 by x, which yields $1.4x$, and multiply 1.4 by 10, which yields 14.
25. a) Zip: $100 + 2p$, where p represents the number of posters; Henry: $150 + p$, where p represents the number of posters **b)** Zip: \$350; Henry: \$275
c) Total cost is \$850. Add Zip's price to Henry's price: \$500 + \$350 = \$850. Or add like terms: $100 + 2p + 150 + p = 250 + 3p$, and then substitute $p = 200$. Simplify to \$850.

5.3 Adding and Subtracting Polynomials, pages 196–199

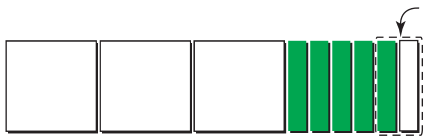
5. C
6. a) $5x - 7$ **b)** $-5a^2 - a + 2$ **c)** $10p$ **d)** $2y^2 + 6y - 6$
7. a) $3x + 4$ **b)** $-n + 3$ **c)** $b^2 - 1$ **d)** $a^2 - a - 1$
8. a) $-3x + 1$ **b)** $x^2 - 2x - 3$



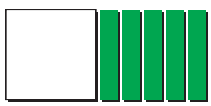
9. a) $x - 1$ **b)** $-2x^2 + 1$



10. a) $9x$ **b)** $-5d - 6$ **c)** $2x^2 - 3x + 5$
11. a) $-3x + 7$ **b)** $-4g^2 + 4g - 2.5$ **c)** $-v^2 - 8v + 1$
12. B
13.



Remove $-2x^2 - x$.



14. a) $-3x - 2$ **b)** $-5b^2 - 9b$ **c)** $-3w + 7$
d) $-m^2 + m$
15. a) $13c - 3$ **b)** $-4r^2 - 3r - 6$ **c)** $2y^2 - 7y$
d) $8j^2 - 4j + 8$
16. a) the perimeter **b)** $6x$ **c)** 30; Example: The expression in part b) was used because it involved fewer steps.