

Student Journal Answers

Chapter 1

Chapter 1 Maintaining Mathematical Proficiency

1. -4
2. -12
3. 7
4. -11
5. *Sample answer:* -2 and -4 , -8 and 2
6. 60°F
7. -26
8. 40
9. -7
10. 10
11. *Sample answer:* -5 and 4 , 10 and -2
12. -9 yd

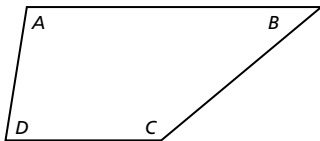
1.1 Explorations

1. a. $110; 90; 92; 68; 360^\circ$
b. $65; 147; 58; 90; 360^\circ$
c. $91; 79; 75; 115; 360^\circ$

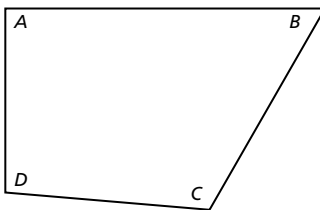
Answers will vary.

2. equals 360°

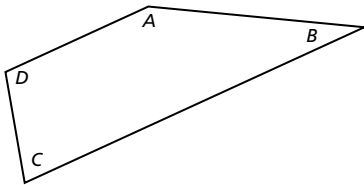
Sample answer:



$$100 + 40 + 140 + 80 = 360$$



$$90 + 60 + 115 + 95 = 360$$



$$150 + 30 + 75 + 105 = 360$$

Divide the quadrilateral into two triangles.

The sum of the angle measures of a triangle is 180° , so the sum of the angle measures of a quadrilateral is $2(180^\circ) = 360^\circ$.

3. a. $85 + 100 + x + 80 = 360; x = 95$
b. $x + 78 + 60 + 72 = 360; x = 150$
c. $90 + 30 + 90 + x = 360; x = 150$
4. Simple equations can relate parts of geometric shapes and can be used to find missing parts.
5. The corners can be arranged so the angles complete a full circle, which is 360° .

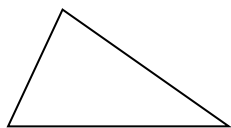
1.1 Extra Practice

1. $w = 12$; Subtract 4 from each side.
2. $x = -19$; Subtract 7 from each side.
3. $w = 21$; Add 15 to each side.
4. $z = 13$; Add 5 to each side.
5. $y = 7$; Add 9 to each side.
6. $q = 5$; Divide each side by 7.
7. $b = -13$; Divide each side by 4.
8. $q = 33$; Multiply each side by 11.
9. $n = 30$; Multiply each side by -2 .
10. $p - 17.95 = 71.80; \$89.75$
11. 40 brownies

1.2 Explorations

1. a. $(30 + x) + 9x + 30 = 180$; Write the equation.
 $10x + 60 = 180$; Combine like terms.
 $10x = 120$; Subtract 60 from each side.
 $x = 12$; Divide each side by 10.
 $42^\circ, 108^\circ, 30^\circ$
- b. $(x + 10) + (x + 20) + 50 = 180$; Write the equation.
 $2x + 80 = 180$; Combine like terms.
 $2x = 100$; Subtract 80 from each side.
 $x = 50$; Divide each side by 2.
 $60^\circ, 70^\circ, 50^\circ$
- c. $50 + (2x + 30) + (2x + 20) + x = 360$;
Write the equation.
 $5x + 100 = 360$; Combine like terms.
 $5x = 260$; Subtract 100 from each side.
 $x = 52$; Divide each side by 5.
 $50^\circ, 134^\circ, 124^\circ, 52^\circ$
- d. $(x - 17) + x + (x + 42) + (x + 35) = 360$;
Write the equation.
 $4x + 60 = 360$; Combine like terms.
 $4x = 300$; Subtract 60 from each side.
 $x = 75$; Divide each side by 4.
 $58^\circ, 75^\circ, 117^\circ, 110^\circ$
- e. $(5x + 2) + (3x + 5) + (8x + 8) + (4x + 15) + (5x + 10) = 540$; Write the equation.
 $25x + 40 = 540$; Combine like terms.
 $25x = 500$; Subtract 40 from each side.
 $x = 20$; Divide each side by 25.
 $102^\circ, 65^\circ, 168^\circ, 95^\circ, 110^\circ$
- f. $(3x + 16) + (3x + 16) + (2x + 8) + (4x - 18) + (2x + 25) + (3x - 7) = 720$; Write the equation.
 $17x + 40 = 720$; Combine like terms.
 $17x = 680$; Subtract 40 from each side.
 $x = 40$; Divide each side by 17.
 $136^\circ, 136^\circ, 88^\circ, 142^\circ, 105^\circ, 113^\circ$
Measure the angles with a protractor.

2. a. *Sample answer:*



b. *Sample answer:* $80^\circ, 35^\circ, 65^\circ$

c. *Sample answer:* $x = 10; 8x, 3x + 5, 6x + 5$

d. Check students' work.

e. *Sample answer:* $(16x + 4) + (6x + 4) + (23x + 2) + (13x + 2) = 360, x = 6; 100^\circ, 40^\circ, 140^\circ, 80^\circ$; yes; The angles are close to those measured with a protractor.

3. Use multi-step equations to find the values of missing parts in an object with the shape of a geometric figure.

4. Connecting a vertex with each of the other vertices in a polygon creates $n - 2$ triangles, each of which has a total angle measure of 180° .

5. 8; Solve the equation $180(n - 2) = 1080$ for n .

1.2 Extra Practice

1. $x = 5$

2. $z = 2$

3. $z = 8$

4. $d = -9$

5. $f = -16$

6. $q = 29$

7. $x = 3.5$

8. $z = -1$

9. $x = 2.5$

10. $z = 0$

11. $z = 0$

12. $z = 1.5$

13. $r = 4$

14. $g = -3$

15. $(2n + 1) + (2n + 3) + (2n + 5) = 63, n = 9; 19, 21, 23$

16. $76^\circ; 38^\circ$

1.3 Explorations

1. $2x + 14 = 3x + 10; x = 4$; Add the side lengths of each figure to get the perimeters and set them equal to each other; $P = 22$

2. a. $x + 18 = 4x + \frac{3}{2}x; x = 4$; Add the side lengths to get the perimeter. Add the area of the triangle to the area of the rectangle to get the total area. Then set the perimeter equal to the area; $P = 22$ ft, $A = 22$ ft²

b. $2x + 14 = 6x - 2; x = 4$; Add the side lengths to get the perimeter. Subtract the area of the small rectangle from the area of the large rectangle to get the total area. Then set the perimeter equal to the area; $P = 22$ ft, $A = 22$ ft²

c. $2\pi + 2x + 4 = 2\pi + 4x; x = 2$; Add the circumference of the semicircle to the remaining 3 side lengths to find the perimeter. Add the area of the semicircle to the area of the rectangle to find the total area. Then set the perimeter equal to the area; $P = 2\pi + 8$ ft, $A = 2\pi + 8$ ft²

3. Collect the variable terms on one side of the equation and the constant terms on the other side of the equation, then solve.

4. *Sample answer:* $5x - 7 = 2x + 5, x = 4;$
 $-x + 3 = 4x + 13, x = -2; 7x = 6x + 4, x = 4$

1.3 Extra Practice

1. $x = -4$

2. $z = -1$

3. $k = 4$

4. $x = 1$

5. $q = -4$

6. $x = 2$

7. $a = 3$

8. $b = 4$

9. $r = 5$

10. $x = 6$

11. no solution

12. infinitely many solutions

13. $n = 0$; one solution

14. $j = 1$; one solution

15. $36x = 2(6x + 6x + 36), 6$

1.4 Explorations

1. a. $A = bh$

b. $30 = b \cdot 5$; Write the equation.

$6 = b$; Divide each side by 5.

c. $A = bh$; Write the formula.

$\frac{A}{h} = b$; Divide each side by h .

d. applied the same steps to solve; used variables instead of constants

2. a. $A = \frac{1}{2}h(b_1 + b_2); h = \frac{2A}{b_1 + b_2}; h = 7$ cm

b. $C = 2\pi r; r = \frac{C}{2\pi}; r = 12$ ft

c. $V = Bh; h = \frac{V}{B}; h = 5$ yd

d. $V = \frac{1}{3}Bh; h = \frac{3V}{B}; h = 6$ m

3. Solve the formula for a different variable; *Sample answer:*

(volume of a cylinder) $V = \pi r^2 h; h = \frac{V}{\pi r^2}$

1.4 Extra Practice

1. $y = 2x + 15$

2. $y = -4x + 2$

3. $y = x - 2$

4. $y = -x + 11$

5. $y = 3x + 4$

6. $y = -\frac{3}{4}x + \frac{3}{2}$

7. $x = \frac{1}{6}y$

8. $x = \frac{q}{3(1 + 3z)}$

9. $x = \frac{r - 4}{7 - s}$

10. $x = \frac{1}{6}y + 1$

11. $x = \frac{r - 4g}{2}$

12. $x = \frac{4z - 4}{3}$

13. $b = \frac{2A}{h}$

14. $h = \frac{3V}{\pi r^2}$

15. $R = \frac{V}{I}$

16. $R = \frac{PV}{nT}$

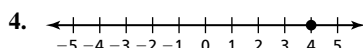
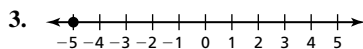
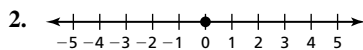
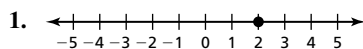
17. a. $r = \frac{A - P}{Pt}$

b. 0.04, or 4%

c. $P = \frac{A}{1 + rt}$

Chapter 2

Maintaining Mathematical Proficiency



5. $>$

6. $<$

7. $>$

8. $<$

9. $=$

10. $<$

11. $-b$