Answers

Chapter 7

7.1 Start Thinking!

For use before Activity 7.1

Sample answer: no; The lengths of the sides can be any two lengths that have the given product; Yes; because the sides of a square are the same length, the area is the square of the side length. For example, if the area is 64 square meters, then the length of each side would be 8 meters.

7.1 Warm Up

For use before Activity 7.1

1. 144 **2.** 81 **3.** 324

4. 2.56 **5.** 6.25 **6.** $\frac{4}{9}$

7.1 Start Thinking!

For use before Lesson 7.1

Shelley; the solutions are 20 and -20.

7.1 Warm Up

For use before Lesson 7.1

1. 9 in. **2.** 13 cm **3.** 1 yd **4.** 1.5 m

7.1 Practice A

1. $s = 14$ in. **2.** $r = 6$ m **3.** ± 4

4. 0 **5.** 11 **6.** $-\frac{1}{6}$

7. $\pm\frac{17}{7}$ **8.** -0.8 **9.** 13

10. 3 **11.** $\sqrt{64} > 5$

12. $0.6 < \sqrt{0.49}$ **13.** $r = 4$ ft

14. $x = 11$ widgets **15.** $s = 10$ in.

7.1 Practice B

1. $s = \frac{13}{15}$ cm **2.** $r = 11$ yd **3.** ± 15

4. ± 20 **5.** -22 **6.** $\pm\frac{5}{8}$ **7.** 2.5

8. ± 1.3 **9.** 4.8 **10.** 6

11. $\sqrt{\frac{49}{9}} > 2$ **12.** $\frac{2}{5} = \sqrt{\frac{12}{75}}$ **13.** $r = 12$ m

14. $s = 24$ m

7.1 Enrichment and Extension

1. $p = \pm 7$ **2.** $a = \pm 10$ **3.** $r = \pm 4$

4. $j = \pm 2$ **5.** $d = \pm 4$ **6.** $y = \pm 2$

7. $x = \pm 5$ **8.** $s = \pm 1$ **9.** $t = \pm 5$

10. $p = \pm 3$ **11.** $r = 5$ ft

7.1 Puzzle Time

EATING SWORDFISH

7.2 Start Thinking!

For use before Activity 7.2

$\sqrt{169} = 13$; *Sample answer:* Square roots are positive unless there is a negative in front of the radical sign.

7.2 Warm Up

For use before Activity 7.2

1. 6 **2.** -8 **3.** $\frac{7}{9}$

4. -15 **5.** 11 **6.** $\frac{12}{13}$

7.2 Start Thinking!

For use before Lesson 7.2

Sample answer: To find the square root of a number, you are determining what number when multiplied by itself, equals the given number. For example, $\sqrt{4} = 2$. To find the cube root of a number, you are determining what number when multiplied by itself, and multiplied by itself again, equals a given number. For example, $\sqrt[3]{8} = 2$.

7.2 Warm Up

For use before Lesson 7.2

1. 40 **2.** $\frac{1}{6}$

7.2 Practice A

1. $s = 30$ cm **2.** $s = \frac{1}{2}$ in. **3.** 5

4. -1 **5.** -2 **6.** -10

7. 20 **8.** 8 **9.** $-\frac{1}{4}$

10. 0.1 **11.** $-\sqrt[3]{27} > -4$

12. $\sqrt[3]{64} > \sqrt{16}$ **13.** $6\pi \approx 18.8$ in.

14. $8\pi \approx 25.1$ m **15.** cube B; 1 ft

Answers

7.2 Practice B

1. 7 **2.** -11 **3.** -20 **4.** 15

5. $\frac{1}{4}$ **6.** $-\frac{5}{3}$ **7.** 138 **8.** $2\frac{17}{27}$

9. -976 **10.** 168 **11.** $-\frac{25}{2}$

12. **a.** 12 ft **b.** 864 ft^2 **c.** 144 ft^2

13. $>$ **14.** $>$

15. *Sample answer:* 8 and -8; 27 and -27

16. 3 m **17.** $x = 2$ **18.** $x = 1$

7.2 Enrichment and Extension

1.

r	n	$x = r^n$	$\sqrt[n]{x}$	Check
1	7	1	1	$1 \bullet 1 \bullet 1 \bullet 1 \bullet 1 \bullet 1 \bullet 1 = 1$
2	6	64	2	$2 \bullet 2 \bullet 2 \bullet 2 \bullet 2 \bullet 2 = 64$
3	5	243	3	$3 \bullet 3 \bullet 3 \bullet 3 \bullet 3 = 243$
4	4	256	4	$4 \bullet 4 \bullet 4 \bullet 4 = 256$

2. 2 **3.** 3 **4.** 5 **5.** 3

6. 3; 27,000 is the least multiple of 9000 that is a perfect cube.

7. 6; 512 is the greatest factor of 3072 that is a perfect cube.

7.2 Puzzle Time

COAT OF PAINT

7.3 Start Thinking!

For use before Activity 7.3

right triangle; yes, any lengths a, b, and c such that $a^2 + b^2 = c^2$

7.3 Warm Up

For use before Activity 7.3

1. 1.2 **2.** ± 30 **3.** $\frac{2}{3}$

4. -21 **5.** ± 22 **6.** -50

Answers

7.3 Start Thinking!

For use before Lesson 7.3

Sample answer: In a gymnastics floor routine, the gymnasts must stay within a 12-meter-by-12-meter square. Often they perform tumbling passes in which they start in one corner of the square and end up in the opposite corner. You can use the Pythagorean Theorem to find how far they traveled from one corner to the other. Also, in baseball, the bases form a square with 90-foot sides. You can use the Pythagorean Theorem to find how far the catcher must throw the ball to throw out a runner at second base.

7.3 Warm Up

For use before Lesson 7.3

1. $c = 10$ cm **2.** $c = 13$ in.

3. $c = 6$ m **4.** $c = 17$ ft

7.3 Practice A

1. $c = 10$ ft **2.** $b = 12$ cm **3.** $a = 2$ m

4. $b = 20$ yd **5.** 6 in.

6. $x = 29$ yd **7.** $x = 6.5$ cm

8. no; The other leg would be 0 meters long, which is impossible.

9. $x = 7$

7.3 Practice B

1. $c = 37$ mm **2.** $a = 3$ ft

3. $b = 2$ in. **4.** $a = 5$ cm

5. 26 in. **6.** 9 in.

7. $x = 6$ cm **8.** 8 fewer blocks

7.3 Enrichment and Extension

1. 3248 mi **2.** 1624 mi

3. 615, 574, 435 **4.** 249,380,384,400

5. 499,380 mi^2 **6.** 360 m^2

7.3 Puzzle Time

STOP HOUNDING ME

7.4 Start Thinking!

For use before Activity 7.4

Sample answer: π, some square roots, like $\sqrt{2}$ and $\sqrt{3}$

7.4 Warm Up

For use before Activity 7.4

1. 50 **2.** 26 **3.** 34

4. 41 **5.** 90 **6.** 6.5

7.4 Start Thinking!

For use before Lesson 7.4

Sample answer: First find the area, 93.5 in.^{2}. Ask yourself, "What number times itself is 93.5?" Because $9^2 = 81$ and $10^2 = 100$, you know that the number must be between 9 and 10. Try squaring values between 9 and 10 to find the number that produces the value closest to 93.5. A square with sides of about 9.7 inches has the same area as an 8.5-inch-by-11-inch sheet of paper.

7.4 Warm Up

For use before Lesson 7.4

1. yes **2.** no **3.** no

4. yes **5.** yes **6.** no

7.4 Practice A

1. yes **2.** no

3. irrational **4.** rational **5.** rational **6.** rational

7. irrational; The area is 4π square feet and π is irrational.

8. a. 6 **b.** 5.7 **9. a.** 25 **b.** 25.1

10. a. -3 **b.** -2.8 **11. a.** 2 **b.** 1.9

12. 18 ft

13. $\sqrt{70}$; $8 = \sqrt{64} < \sqrt{70}$

14. 3; A positive number is greater than a negative number.

15. $16\frac{1}{4}$; $\sqrt{210} < \sqrt{225} = 15$

16. $\sqrt{\frac{4}{25}}$; $\sqrt{\frac{4}{25}} = \frac{2}{5} = \frac{4}{10}$

17. $4 < a < 9$; *Sample answer*: $a = 6$.

18. yes; $\sqrt{\frac{1}{9}} = \frac{1}{3}$

19. no; 5 is not a perfect square.

20. yes; $\sqrt{\frac{2}{18}} = \sqrt{\frac{1}{9}} = \frac{1}{3}$

Answers

7.4 Practice B

1. no **2.** yes

3. rational **4.** rational **5.** rational **6.** irrational

7. irrational; The circumference is 10π meters and π is irrational.

8. a. -5 **b.** -5.3 **9. a.** 20 **b.** 19.9

10. a. 1 **b.** 0.9 **11. a.** 1 **b.** 1.2

12. a. $c = \sqrt{2450}$

b. $\left(49^2 = 2401\right) < 2450 < \left(50^2 = 2500\right)$

c. 49.5 ft

13. $\sqrt{220}$; $14.75^2 = 217.5625$

14. $-\sqrt{135}$; $-145 < -135$, so $-\sqrt{145} < -\sqrt{135}$

15. $\frac{3}{8}; \left(\frac{3}{8}\right)^2 = \frac{9}{64} > \frac{7}{64}$

16. $-0.25; -\sqrt{\frac{1}{4}} = -0.5$

17. $49 < a < b < 64$; *Sample answer*: $a = 50$, $b = 60$

7.4 Enrichment and Extension

1. 36 and 49 **2.** 7

3. 6.71 **4.** 6.855

5. 46.99; The numbers are very close.

6. 5.4775; The square of the estimate is about 30.003, which is very close to 30.

7.4 Puzzle Time

THE LOBSTER THAT BECAME A POLICEMAN BECAUSE HE BELIEVED IN CLAW AND ORDER

Extension 7.4 Start Thinking!

For use before Extension 7.4

Sample answer: You determine a decimal is a repeating decimal if a given set of numbers repeats itself consistently.

Extension 7.4 Warm Up

For use before Extension 7.4

1. terminating **2.** repeating

3. repeating **4.** terminating

5. repeating **6.** repeating

Extension 7.4 Practice

1. $\frac{2}{9}$ **2.** $-\frac{7}{9}$ **3.** $-2\frac{1}{3}$

4. $8\frac{7}{9}$ **5.** $-10\frac{5}{9}$ **6.** $24\frac{8}{9}$

7. $\frac{26}{45}$ **8.** $-1\frac{41}{90}$ **9.** $-3\frac{13}{15}$

10. $-\frac{32}{99}$ **11.** $6\frac{13}{99}$ **12.** $7\frac{10}{11}$

7.5 Start Thinking!

For use before Activity 7.5

$a^2 + b^2 = c^2$; *Sample answer:* 3, 4, and 5; No, the lengths must form a right triangle.

7.5 Warm Up

For use before Activity 7.5

1. 2.5 in. **2.** $3\sqrt{2}$ cm

3. 48 ft **4.** $\sqrt{33}$ m

7.5 Start Thinking!

For use before Lesson 7.5

Answers will vary. Check students' problems and sketches.

7.5 Warm Up

For use before Lesson 7.5

1. If $|a| = -a$, then a is a negative number; false; $a = 0$

2. If two lines are perpendicular, then one line is vertical and the other line is horizontal; false; $y = 2x$ is perpendicular to $y = -\frac{1}{2}x$ and the lines are not vertical or horizontal.

3. If a^2 is a positive number, then a is a negative number; false; $a^2 = 4$ and $a = 2$

4. If $a - 1$ is an even number, then a is an odd number; true; Adding 1 to an even number creates an odd number.