Student Workbook Answers

9. 12

10. $P''(6, 1), Q''(10, 5), R''(2, 9)$

Chapter 7

7.1 Activity

1. a–e. *Answer should include, but is not limited to:* Students should draw a trapezoid, estimate the area, label the height and bases, and cut the trapezoid out. Then the student will draw a line from the midpoint to the opposite upper vertex, cut along the line, and arrange the pieces to form a triangle.

f. Area $= \frac{1}{2}(b_1 + b_2)h$

g. *Answer should include, but is not limited to:* Students should use the formula from part (f) to find the area of their trapezoids.

h. *Answer should include, but is not limited to:* Students should compare the area from part (g) with their estimates in part (b).

2. *Answer should include, but is not limited to*: The students should write lessons on finding the area of trapezoids. Students should describe steps to find the area of a trapezoid, give two examples, and write two exercises.

3. *Sample answer*: A trapezoid can be cut and rearranged to form a triangle where the base is the sum of the bases of the trapezoid. So, the area of the trapezoid is the area of a triangle whose base is the sum of the bases of the trapezoid.

4. *Sample answer*: Astronomers use deductive reasoning when they determine the position of the stars.

7.1 Practice

1. 34 units^2 **2.** 33 units^2

3. 45 in.^{2} **4.** 64 m^2

5. The bases should be added, not multiplied, in the formula.

$$A = \frac{1}{2}(3)(2 + 6) = 12 \text{ ft}^2$$

6. 10 units^2 **7.** 16 units^2

8. 22 cm

7.2 Activity

1.

Sides	Large Perimeter	Diameter of Circle
4	140 mm	35 mm
6	120 mm	35 mm

Small Perimeter	Large Perimeter / Diameter	Small Perimeter / Diameter	Average of Ratios
100 mm	$\frac{4}{1}$	$\frac{20}{7}$	$\frac{24}{7} \approx 3.43$
108 mm	$\frac{24}{7}$	$\frac{108}{35}$	$\frac{114}{35} \approx 3.26$

a. The value of π is slightly more than 3, because this is the value being approached in the last column of the table.

b. more accurate

2. a. about 7.9 inches; about 3.16

b. Check students' work; about 25.1 cm; about 3.14

c. The ratios are progressively closer to 3.14.

d. Within 0.02 in part (a), closer in part (b)

3. Because π is circumference divided by diameter, circumference is π times diameter. So, to find the circumference, multiply the value of π by the diameter; $C = \pi d$.

4. Check students' work.

7.2 Practice

1. 30 ft **2.** 4 m **3.** 32 mm

4. 5 cm **5.** 12 in. **6.** 3.5 yd

7. about 53.38 m **8.** about 18.84 ft

9. about 88 in. **10.** about 56.54 mm

11. about 20.56 in. **12.** about 25.7 yd

13. a. 8 mm; 24 mm **b.** 3 times greater

14. \$131.56 **15.** about 5.14 ft

Student Workbook Answers

7.3 Activity

1. a. Pattern: The perimeter of each figure is 2 greater than the last; Perimeter of tenth figure: 22

b. Pattern: The perimeter of each figure is 4 greater than the last; Perimeter of tenth figure: 40

c. Pattern: The perimeter of each figure is π greater than the last; Perimeter of tenth figure: about 33.4

2. a. 556 yards

b. less; By combining the corrals, you are eliminating the fencing for two 70-yard sides. So, the rancher needs only $556 - 2(70) = 416$ yards of fencing.

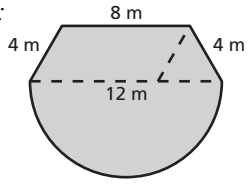
c. *Sample answer:* The corrals can be combined by stacking them. This eliminates the fencing for two 74-yard sides. So, the rancher needs only $556 - 2(74) = 408$ yards of fencing.

3. a. 133 tiles

b. *Sample answer:* Hourly wage: \$25 per hour
Bid amount: \$1363.25
Estimated profit = \$830

4. To find the perimeter of a composite figure, find the distance around the figure.

Sample answer:



Perimeter $\approx$ 34.84 m

7.3 Practice

1. about 24 in. **2.** about 28 in. **3.** about 21.42 in.

4. 34 yd **5.** 24 in. **6.** 60 mm

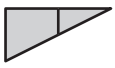
7. 31 m **8.** 24 ft **9.** 64 cm

10. about 23.42 ft **11.** \$3685.90

7.4 Activity

1. a. 100 square units

b.

Region			
Area	1 square unit	$\frac{1}{2}$ square unit	1 square unit

c. about 78 units^2; Find the total area of the region outside the circle using the table from part (b). Then, subtract that area from the area of the grid to find the area of the circles.

d. 4; 3.12; Because 5^2 is part of the equation, divide 100 by $25(4)$ and 78 by $25(3.12)$.

e. radius; The area of the circle is about $3r^2$.

2. a–c. Check students' work.

d. height $\approx r$, base $\approx r\pi$

e. area $\approx \pi r^2$; You can conclude that the area of the circle is approximately πr^2.

3. *Sample answer:* You can estimate the area of a circle by using a grid of unit squares, or by dividing the circle into equal sections, then using them to form a parallelogram so you can find its area.

4. $A = \pi r^2$; *Sample answer:* A dinner plate has a radius of 5 inches. $A \approx 78.5$ in.^{2}

7.4 Practice

1. about 78.5 m^2 **2.** about 7850 mm^2

3. about 1256 in.^{2} **4.** about 38.5 ft^2

5. about 1386 mm^2 **6.** about 3850 cm^2

7. about 50.24 ft^2 **8.** about 15,400 cm^2

9. about 113.04 in.^{2} **10.** about 28.26 in.^{2}

11. about $\frac{99}{224}$ in.^{2} **12.** about 153.86 in.^{2}

7.5 Activity

1. *Sample answer:*

a. WY

b. 87,500 mi^2

c. The easiest to find have rectangular outlines. The areas of states with curved outlines are difficult to find because the curves do not line up with the grid lines.

2. a. Answers will vary depending on students' measurements.

b. Because they should add up to 150 square centimeters when put together

3. none; Each pattern of circles has the same area.

4. *Sample answer:* Add the areas of all the pieces that form the figure.

Student Workbook Answers

5. *Answer should include, but is not limited to:* A list of area formulas for squares, rectangles, triangles, trapezoids, parallelograms, and circles

A sample composite figure made up of each type of basic figure with dimensions labeled and area calculated

7.5 Practice

1. 30 units^2 **2.** 33 units^2 **3.** 16 units^2

4. 48 in.^{2} **5.** about 178.5 mm^2

6. 402 ft^2 **7.** 210 cm^2

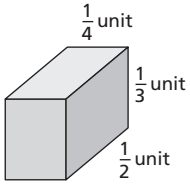
8. 60 yd^2 **9.** 40 m^2

10. perimeter: about 37.85 ft; area: about 69.625 ft^2

11. a. 144 in.^{2} **b.** 72 in.^{2} **c.** \$172.80

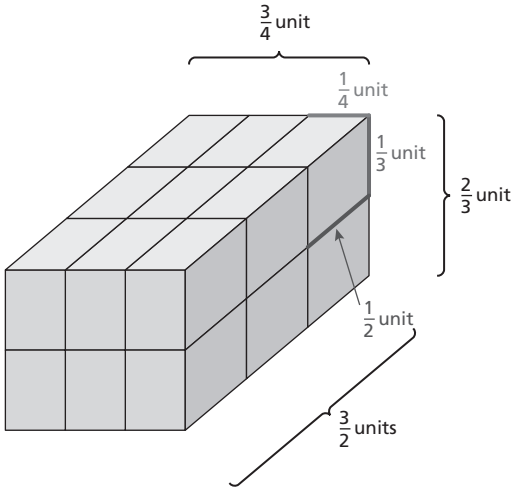
7.6 Activity

1. a.



b. $\frac{1}{24}$, $\frac{1}{24}$ unit^3; 24 identical prisms make up the unit cube, so one represents $\frac{1}{24}$ of the volume. The volume of the unit cube is 1 unit^3, so the volume of one of the identical prisms is $\frac{1}{24}$ unit^3.

2. a. 18;



b. $\frac{18}{24}$, or $\frac{3}{4}$ units^3; Each identical prism has an area of $\frac{1}{24}$ cubic unit and it takes 18 of them to fill the rectangular prism. The volume of the 18 identical prisms is $18 \bullet \frac{1}{24} = \frac{18}{24}$, or $\frac{3}{4}$ cubic unit.

3. a. $\frac{1}{12}$ unit: yes; $\frac{1}{4}$ unit: no; $\frac{1}{3}$ unit: no; $\frac{1}{2}$ unit: no; only the $\frac{1}{12}$ unit dimension divides evenly into each of the dimensions of the prism in Activity 2.

b. 1296 cubes; You can multiply the number of cubes by the volume of one cube.

4. yes; *Sample answer:* The formulas work for the prisms in Activities 2 and 3.

5. *Sample answer:* Fill the prism using identical prisms with unit fraction edge lengths for which you know the volume, count the number of prisms needed, and multiply to find the volume, or use the formula $V = Bh$ or $V = \ell wh$.

7.6 Practice

1. $\frac{5}{18}$ m^3 **2.** $\frac{9}{512}$ cm^3 **3.** $\frac{21}{16}$ yd^3 **4.** 11 in.

5. 16 m **6.** 9 yd **7.** 75 cm **8.** 1 ft

9. 280 ft^3 **10.** 16 cm^3

11. The volume is multiplied by 8.

12. 432 in.^{2}

7.6 Extension Activity

1. b. $\frac{11}{2}$ in.^{2} **c.** $\frac{22}{5}$ in.^{2} **d.** $\frac{41}{18}$ in.^{2}

2. a. i. yes **ii.** no **iii.** yes

b. i. no **ii.** yes **iii.** yes

3. *Sample answer:* Place a grid over each face. Count the total number of squares. Then multiply the total number of squares by the area of one square.

4. *Sample answer:* Find the area of one face and multiply by 6.

Student Workbook Answers

5. *Sample answer:* Find the surface area of the box. Then increase the surface area slightly to account for the overlap you will need when you tape the paper together to cover the box.

7.6 Extension Practice

1. 25 in.^{2} **2.** 102 m^2 **3.** 46 cm^2

4. $7\frac{5}{9}$ in.^{2} **5.** $27\frac{21}{25}$ mm^2 **6.** 30.62 m^2

7. no

Chapter 8

8.1 Activity

1. a. Check students' work.

b. Check students' work.

2. a. Check students' work.

b. Check students' work.

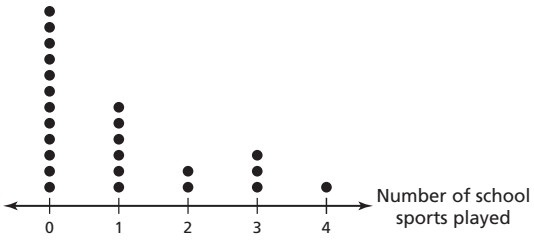
c. Check students' work. The crease should be on the same value they found in part (b); 4 values; 4 values.

3. a. 0

b. yes; *Sample answer:* When every value in a data set occurs only once, there would be no mode. When only two values occur most often, there would be two modes.

c. yes; *Sample answer:* It is the value or values in the data set that occur most often. So, it has to be in the data set itself.

4. a.



Sample answer: The maximum value of 12 occurs at 0. The next highest value occurs at 1, and the rest of the values are distributed over 2, 3 and 4.

b. 0; 4 **c.** 4

d. Sample answer: The range represents the spread of a data set. The difference between the greatest value and the least value shows the amount by which the data values vary.

5. *Sample answer:* You can use the mean, median, mode, and range to describe a data set.

6. *Sample answer:* Mean, median, and mode are measures of center of a data set and they can be used to describe the typical value of a data set. Range is a measure of variation of a data set and it can be used to describe the distribution of a data set.

8.1 Practice

1. mean: 79; median: 78; mode: none; *Sample answer:* The mean and median are close in value and both represent the data well.

2. mean: 53.75; median: 56.5; mode: 65; *Sample answer:* The median is probably best, because the mode is the highest data value and the mean is less than most of the data values.

3. mean: 92; median: 75; mode: 73; *Sample answer:* The mean is probably best. The median and mode are both close to the lower values but far away from the greater values.

4. mean: 24.4; median: 20.45; mode: none; *Sample answer:* The median is probably best, because the mean is greater than all but one of the data values.

5. *with outlier:* mean: 64, median: 71, mode: 72; *without outlier:* mean: $70\frac{1}{3}$, median: 71.5, mode: 72; The mean is most affected. It is much lower with the outlier. The median is slightly lower with the outlier. The mode is unchanged by the outlier.

6. *with outlier:* mean: 84.375, median: 77.5, mode: 85; *without outlier:* mean: 75, median: 70, mode: 85; The mean and median are both greater with the outlier. The mode is unchanged by the outlier.

7. mean: 0.4; median: 0.405; mode: none

8. mean: 2.1; median: 2.25; mode: 2.4

9. mean: $\frac{1}{2}$; median: $\frac{1}{2}$; mode: $\frac{1}{2}$

10. mean: $3\frac{1}{4}$; median: $3\frac{9}{16}$; mode: $4\frac{1}{8}$

11. 37 **12.** 59

13. 44 yd; *Sample answer:* Because the mean is 30, the quotient of the sum of the data values and 5 must be 30, so the sum of the data values must be 150. The fifth punt has to be 44 yards for the sum to be 150.