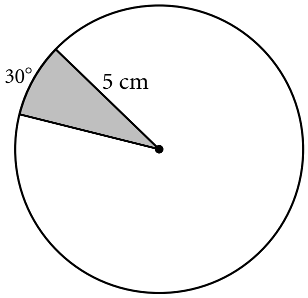
Lesson 8.4 • Areas of Sectors

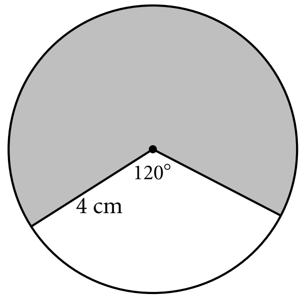
Name ________________________ Period __________ Date ____________

In Exercises 1–6, find the area of the shaded region. Write your answers in terms of π and rounded to the nearest 0.01 cm^2.

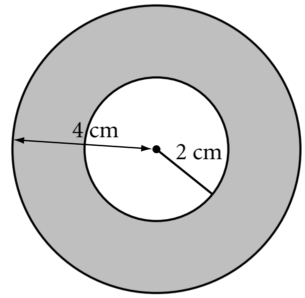
1.



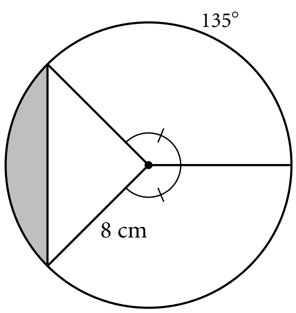
2.



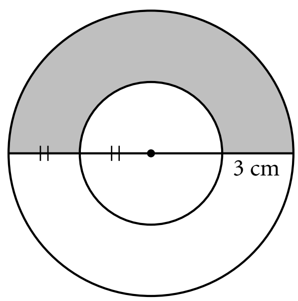
3.



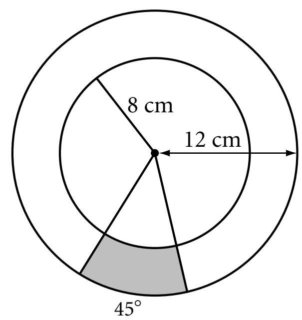
4.



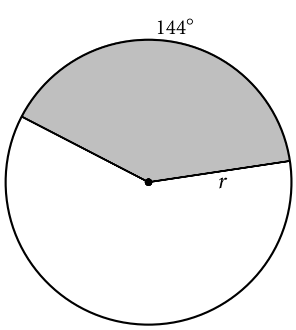
5.



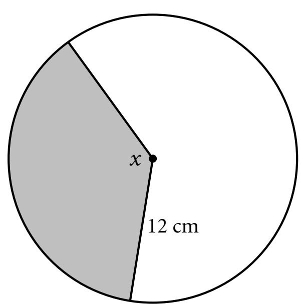
6.



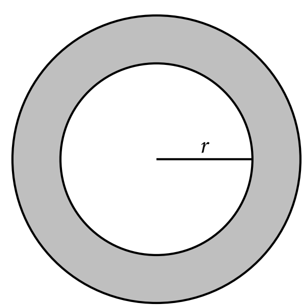
7. Shaded area is 40π cm^2. Find r.



8. Shaded area is 54π cm^2. Find x.



9. Shaded area is 51π cm^2. The diameter of the larger circle is 20 cm. Find r.

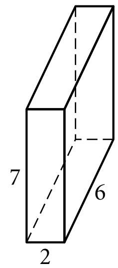


Lesson 8.5 • Surface Area

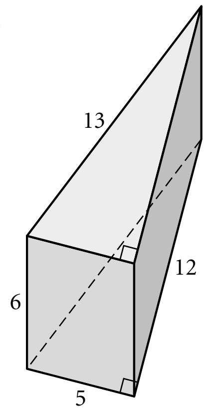
Name ______________________________ **Period** ________ **Date** ____________

In Exercises 1–8, find the surface area of each solid. All quadrilaterals are rectangles, and all measurements are in centimeters. Round your answers to the nearest 0.1 cm^2.

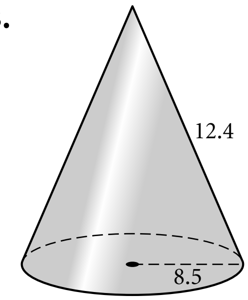
1.



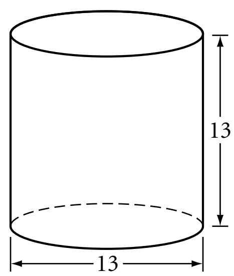
2.



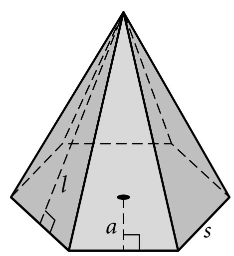
3.



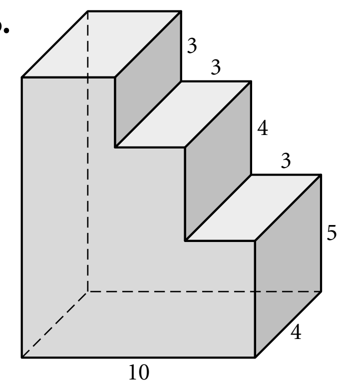
4.



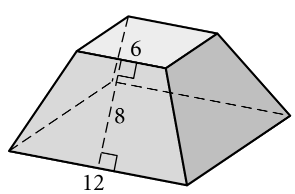
5. Base is a regular hexagon. $s = 6$, $a \approx 5.2$, and $l = 9$.



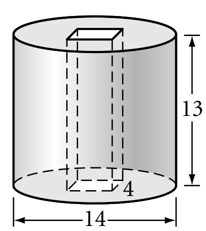
6.



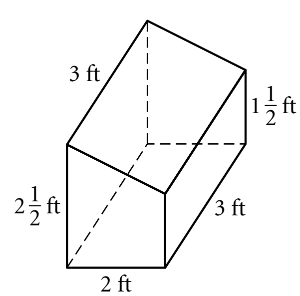
7. Both bases are squares.



8. A square hole in a round peg



9. Ilsa is building a museum display case. The sides and bottom will be plywood and the top will be glass. Plywood comes in 4 ft-by-8 ft sheets. How many sheets of plywood will she need to buy? Explain. Sketch a cutting pattern that will leave her with the largest single piece possible.

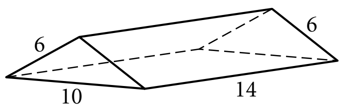


Lesson 11.2 • Volume of Prisms and Cylinders

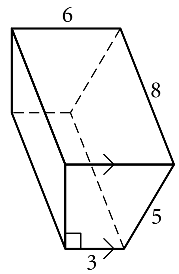
Name ______________________________ **Period** __________ **Date** ____________

In Exercises 1–3, find the volume of each prism or cylinder. All measurements are in centimeters. Round your answers to the nearest 0.01.

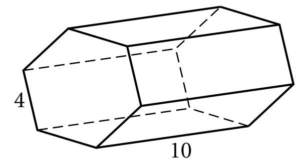
1. Right triangular prism



2. Right trapezoidal prism

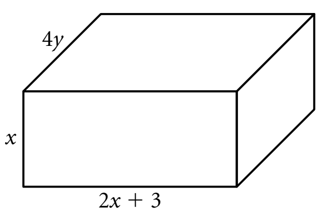


3. Regular hexagonal prism

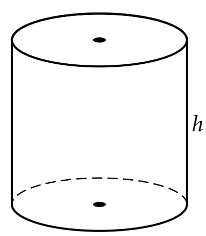


In Exercises 4–6, use algebra to express the volume of each solid.

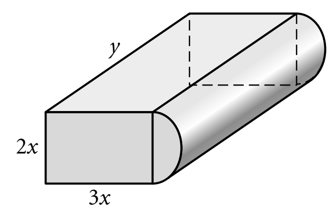
4. Right rectangular prism



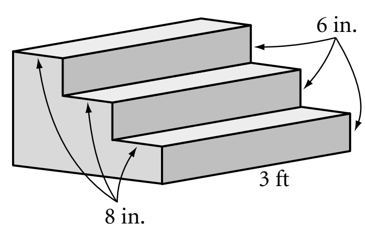
5. Right cylinder; base circumference $= p\pi$



6. Right rectangular prism and half of a cylinder



7. You need to build a set of solid cement steps for the entrance to your new house. How many cubic feet of cement do you need?

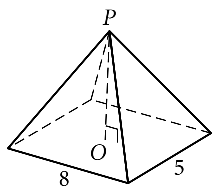


Lesson 11.3 • Volume of Pyramids and Cones

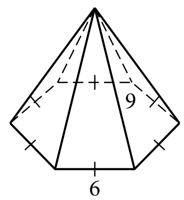
Name ______________________________ **Period** __________ **Date** ______________

In Exercises 1–3, find the volume of each solid. All measurements are in centimeters. Round your answers to two decimal places.

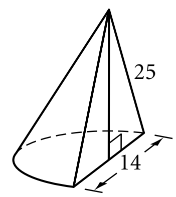
1. Rectangular pyramid; $OP = 6$



2. Right hexagonal pyramid

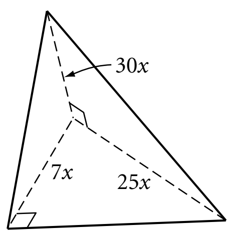


3. Half of a right cone

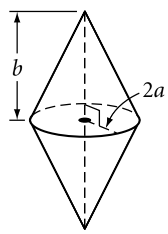


In Exercises 4–6, use algebra to express the volume of each solid.

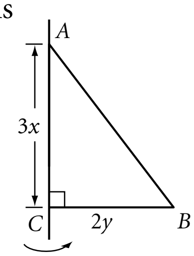
4.



5.

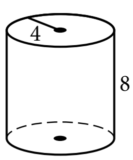


6. The solid generated by spinning $\triangle ABC$ about the axis

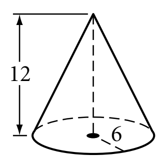


In Exercises 7–9, find the volume of each figure and tell which volume is larger.

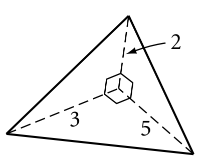
7. **A.**



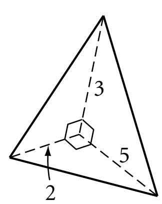
B.



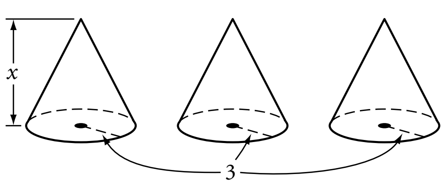
8. **A.**



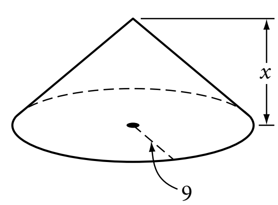
B.



9. **A.**



B.



Lesson 11.4 • Applications of Volume

Name ______________________ Period __________ Date ______________

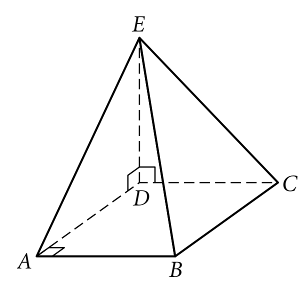
1. A cone has volume 320 cm^3 and height 16 cm. Find the radius of the base. Round your answer to the nearest 0.1 cm.

2. How many cubic inches are there in one cubic foot? Use your answer to help you with Exercises 3 and 4.

3. Jerry is packing cylindrical cans with diameter 6 in. and height 10 in. tightly into a box that measures 3 ft by 2 ft by 1 ft. All rows must contain the same number of cans. The cans can touch each other. He then fills all the empty space in the box with packing foam. How many cans can Jerry pack in one box? Find the volume of packing foam he uses. What percentage of the box's volume is filled by the foam?

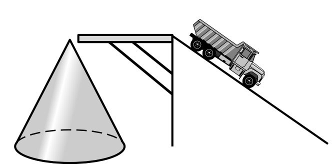
4. A king-size waterbed mattress measures 72 in. by 84 in. by 9 in. Water weighs 62.4 pounds per cubic foot. An empty mattress weighs 35 pounds. How much does a full mattress weigh?

5. Square pyramid *ABCDE,* shown at right, is cut out of a cube with base *ABCD* and shared edge $\overline{DE}$. $AB = 2$ cm. Find the volume and surface area of the pyramid.



6. In Dingwall the town engineers have contracted for a new water storage tank. The tank is cylindrical with a base 25 ft in diameter and a height of 30 ft. One cubic foot holds about 7.5 gallons of water. About how many gallons will the new storage tank hold?

7. The North County Sand and Gravel Company stockpiles sand to use on the icy roads in the northern rural counties of the state. Sand is brought in by tandem trailers that carry 12 m^3 each. The engineers know that when the pile of sand, which is in the shape of a cone, is 17 m across and 9 m high they will have enough for a normal winter. How many truckloads are needed to build the pile?



Lesson 11.5 • Displacement and Density

Name ________________________ **Period** __________ **Date** ____________

1. A stone is placed in a 5 cm-diameter graduated cylinder, causing the water level in the cylinder to rise 2.7 cm. What is the volume of the stone?

2. A 141 g steel marble is submerged in a rectangular prism with base 5 cm by 6 cm. The water rises 0.6 cm. What is the density of the steel?

3. A solid wood toy boat with a mass of 325 g raises the water level of a 50 cm-by-40 cm aquarium 0.3 cm. What is the density of the wood?

4. For Awards Night at Baddeck High School, the math club is designing small solid silver pyramids. The base of the pyramids will be a 2 in.-by-2 in. square. The pyramids should not weigh more than $2\frac{1}{2}$ pounds. One cubic foot of silver weighs 655 pounds. What is the maximum height of the pyramids?

5. While he hikes in the Gold Country of northern California, Sid dreams about the adventurers that walked the same trails years ago. He suddenly kicks a small bright yellowish nugget. Could it be gold? Sid quickly makes a balance scale using his walking stick and finds that the nugget has the same mass as the uneaten half of his 330 g nutrition bar. He then drops the stone into his water bottle, which has a 2.5 cm radius, and notes that the water level goes up 0.9 cm. Has Sid struck gold? Explain your reasoning. (Refer to the density chart in Lesson 10.5 in your book.)

LESSON 8.4 • Areas of Sectors

1. $\frac{25\pi}{12}$ cm^2 ≈ 6.54 cm^2

2. $\frac{32\pi}{3}$ cm^2 ≈ 33.51 cm^2

3. 12π cm^2 ≈ 37.70 cm^2

4. $(16\pi - 32)$ cm^2 ≈ 18.27 cm^2

5. 13.5π cm^2 ≈ 42.41 cm^2

6. 10π cm^2 ≈ 31.42 cm^2

7. $r = 10$ cm **8.** $x = 135°$ **9.** $r = 7$ cm

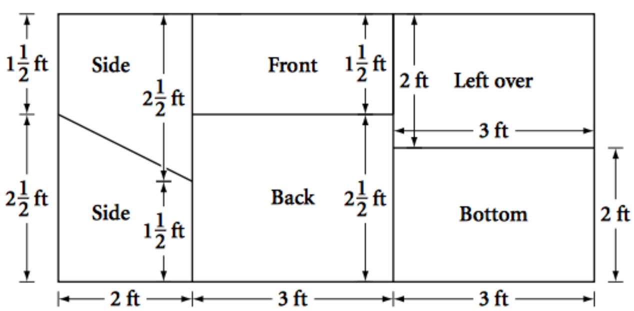
LESSON 8.5 • Surface Area

1. 136 cm^2 **2.** 240 cm^2 **3.** 558.1 cm^2

4. 796.4 cm^2 **5.** 255.6 cm^2 **6.** 356 cm^2

7. 468 cm^2 **8.** 1055.6 cm^2

9. 1 sheet: front rectangle: $3 \cdot 1\frac{1}{2} = 4\frac{1}{2}$; back rectangle: $3 \cdot 2\frac{1}{2} = 7\frac{1}{2}$; bottom rectangle: $3 \cdot 2 = 6$; side trapezoids: $2\left(2 \cdot \frac{2\frac{1}{2} + 1\frac{1}{2}}{2}\right) = 8$; total $= 26$ ft^2. Area of 1 sheet $= 4 \cdot 8 = 32$ ft^2. Possible pattern:



LESSON 11.2 • Volume of Prisms and Cylinders

1. 232.16 cm^3 **2.** 144 cm^3

3. 415.69 cm^3

4. $V = 4xy(2x + 3)$, or $8x^2y + 12xy$

5. $V = \frac{1}{4}p^2h\pi$ **6.** $V = \left(6 + \frac{1}{2}\pi\right)x^2y$

7. 6 ft^3

LESSON 11.3 • Volume of Pyramids and Cones

1. 80 cm^3 **2.** 209.14 cm^3 **3.** 615.75 cm^3

4. $V = 840x^3$ **5.** $V = \frac{8}{3}\pi a^2 b$ **6.** $V = 4\pi xy^2$

7. **A:** 128π cubic units, **B:** 144π cubic units. **B** is larger.

8. **A:** 5 cubic units, **B:** 5 cubic units. They have equal volumes.

9. **A:** $9\pi x$ cubic units, **B:** $27\pi x$ cubic units. **B** is larger.

LESSON 11.4 • Applications of Volume

1. 4.4 cm **2.** 1728 in^3

3. 24 cans; 3582 in^3 = 2.07 ft^3; 34.6%

4. 2000.6 lb (about 1 ton)

5. Note that $\overline{AE} \perp \overline{AB}$ and $\overline{EC} \perp \overline{BC}$. $V = \frac{8}{3}$ cm^3; $SA = (8 + 4\sqrt{2})$ cm^2 ≈ 13.7 cm^2

6. About 110,447 gallons

7. 57 truckloads

LESSON 11.5 • Displacement and Density

All answers are approximate.

1. 53.0 cm^3 **2.** 7.83 g/cm^3

3. 0.54 g/cm^3 **4.** 4.94 in.

5. No, it's not gold (or at least not pure gold). The mass of the nugget is 165 g, and the volume is 17.67 cm^3, so the density is 9.34 g/cm^3. Pure gold has density 19.3 g/cm^3.