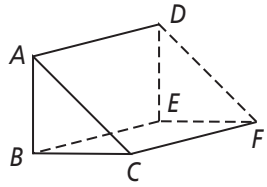
Name _____ Class _____ Date _____

Extra Practice

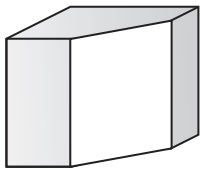
Chapter 11

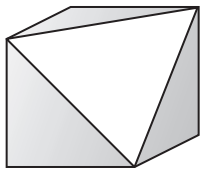
Lesson 11-1

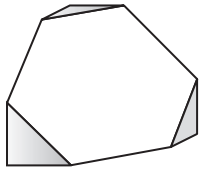
1. Look at the polyhedron at the right.
   a. How many vertices are there? List them. **6; *A, B, C, D, E, F***
   b. How many edges are there? List them. **9; $\overline{AB}$, $\overline{AC}$, $\overline{AD}$, $\overline{BC}$, $\overline{BE}$, $\overline{CF}$, $\overline{DE}$, $\overline{DF}$, $\overline{EF}$**
   c. How many faces are there? List them. **5; $\triangle ABC$, $\triangle DEF$, $\square ABED$, $\square ACFD$, $\square BCFE$**



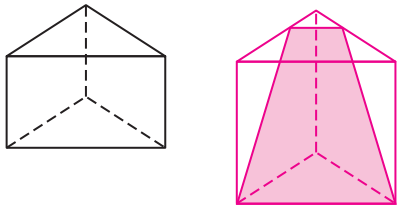
The diagrams in Exercises 2–4 each show a cube after part of it has been cut away. Identify the shape of the cross section formed by the cut. Also, verify Euler's Formula, $F + V = E + 2$, for the polyhedron that remains.

2. 
rectangle; 7 + 10 = 15 + 2

3. 
equilateral △; 7 + 7 = 12 + 2

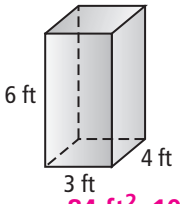
4. 
hexagon; 7 + 10 = 15 + 2

5. The bases of the prism shown at the right are equilateral triangles. Make a sketch that shows how you can have a plane intersect the prism to give a cross section that is an isosceles trapezoid.

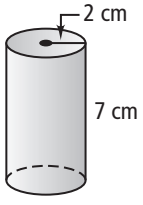


Lessons 11-2 and 11-3

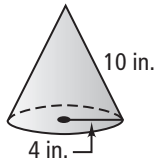
Find the (a) lateral area and (b) surface area of each figure. Leave your answers in terms of π or in simplest radical form.

6. 

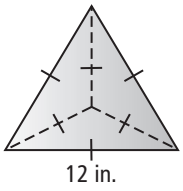
84 ft²; 108 ft²

7. 

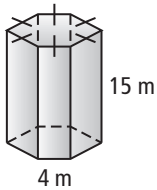
28π cm²; 36π cm²

8. 

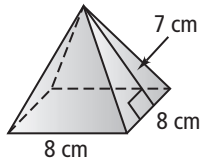
40π in.²; 56π in.²

9. 

$108\sqrt{3}$ in.²; $144\sqrt{3}$ in.²

10. 

360 m²; $(360 + 48\sqrt{3})$ m²

11. 

112 cm²; 176 cm²

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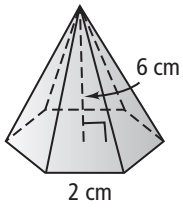
Extra Practice (continued)

Chapter 11

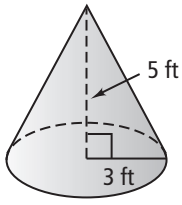
Find the (a) lateral area and (b) surface area of each pyramid or cone. Assume that the base of each pyramid is a regular polygon. Round your answers to the nearest tenth.

12.



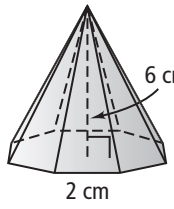
37.5 cm^2; 47.9 cm^2

13.



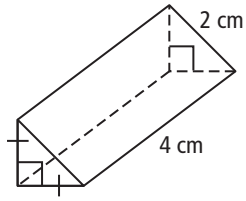
55.0 ft^2; 83.2 ft^2

14.



51.7 cm^2; 71.0 cm^2

15. An optical instrument contains a triangular glass prism with the dimensions shown at the right. Find the lateral area and surface area of the prism. Round to the nearest tenth. 19.3 cm^2; 21.3 cm^2

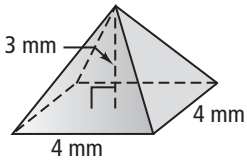


16. A company packages salt in a cylindrical box that has a diameter of 8 cm and a height of 13.5 cm. Find the lateral area and surface area of the box. Round to the nearest tenth. 339.3 cm^2; 439.8 cm^2

Lessons 11-4 and 11-5

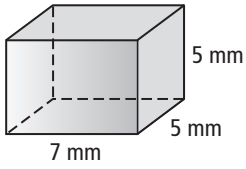
Find the volume of each figure. Round your answers to the nearest tenth.

17.



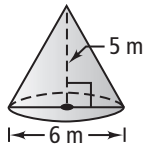
16 mm^3

18.



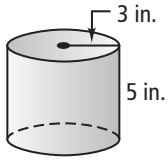
175 mm^3

19.



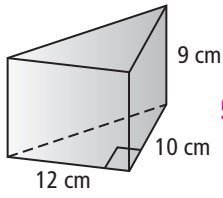
47.1 m^3

20.



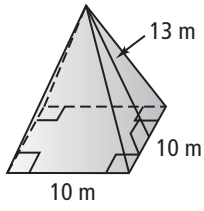
141.4 $in.^3$

21.



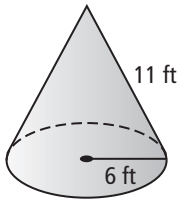
540 cm^3

22.



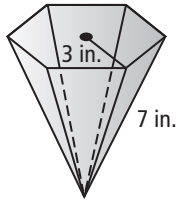
400 $in.^3$

23.



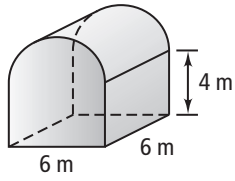
347.6 m^3

24.



49.3 $in.^3$

25.

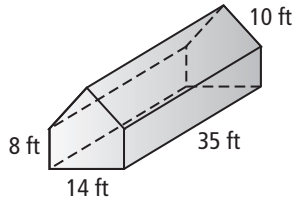


228.8 m^3

Extra Practice (continued)

Chapter 11

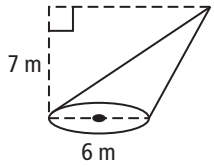
26. A greenhouse has the dimensions shown in the figure. What is the volume of the greenhouse? Round to the nearest cubic foot. **5670 ft^3**



27. Find the volume of a can of chicken broth that has a diameter of 7.5 cm and a height of 11 cm. Round to the nearest tenth. **486.0 cm^3**

28. A paper drinking cup is a cone that has a diameter of $2\frac{1}{2}$ in. and a height of $3\frac{1}{2}$ in. How many cubic inches of water does the cup hold when it is full to the brim? Round to the nearest tenth. **5.7 in.^{3}**

29. Find the volume of an oblique cone with diameter 6 m and height 7 m. Give your answers in terms of π and also rounded to the nearest cubic meter. **21π m^3; 66 m^3**



Lesson 11-6

Find the volume and surface area of a sphere with the given radius or diameter. Give each answer in terms of π and rounded to the nearest whole number.

30. $r = 5$ cm **$\frac{500\pi}{3}$ cm^3, 524 cm^3; 100π cm^2, 314 cm^2**

31. $r = 3$ ft **36π ft^3, 113 ft^3; 36π ft^2, 113 ft^2**

32. $d = 8$ in. **$\frac{256\pi}{3}$ in.^{3}, 268 in.^{3}; 64π in.^{2}, 201 in.^{2}**

33. $d = 2$ ft **$\frac{4\pi}{3}$ ft^3, 4 ft^3; 4π ft^2, 13 ft^2**

34. $r = 0.5$ in. **$\frac{\pi}{6}$ in.^{3}, 1 in.^{3}; π in.^{2}, 3 in.^{2}**

35. $d = 9$ m **$\frac{243\pi}{2}$ m^3, 382 m^3; 81π m^2, 254 m^2**

The surface area of each sphere is given. Find the volume of each sphere in terms of π.

36. 64π m^2 **$\frac{256\pi}{3}$ m^3**

37. 16π in.^{2} **$\frac{32\pi}{3}$ in.^{3}**

38. 49π ft^2 **$\frac{343\pi}{6}$ ft^3**

39. A spherical beach ball has a diameter of 1.75 ft when it is full of air. What is the surface area of the beach ball, and how many cubic feet of air does it contain? Round to the nearest hundredth. **9.62 ft^2; 2.81 ft^3**

Extra Practice (continued)

Chapter 11

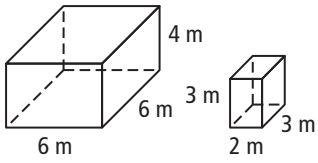
Lesson 11-7

Copy and complete the table for three similar solids.

	Similarity Ratio	Ratio of Surface Areas	Ratio of Volumes
40.	2 : 3	4 : 9	8 : 27
41.	5 : 8	25 : 64	125 : 512
42.	3 : 4	9 : 16	27 : 64

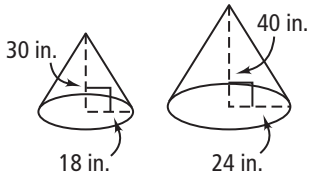
Are the two figures similar? If so, give the similarity ratio.

43.



yes; 2 : 1

44.



yes; 3 : 4

The surface areas of two similar figures are given. The volume of the larger figure is given. Find the volume of the smaller figure.

45. S.A. $= 160\ \text{ft}^2$
S.A. $= 250\ \text{ft}^2$
$V = 600\ \text{ft}^3$ $307.2\ \text{ft}^3$

46. S.A. $= 121\ \text{cm}^2$
S.A. $= 196\ \text{cm}^2$
$V = 343\ \text{cm}^3$ $\approx 166.4\ \text{cm}^3$

47. S.A. $= 4\ \text{yd}^2$
S.A. $= 4.5\ \text{yd}^2$
$V = 8\ \text{yd}^3$ $\approx 6.7\ \text{yd}^3$

48. How do the surface area and volume of a cylinder change if the radius and height are multiplied by $\frac{5}{4}$? S.A. is multiplied by $\frac{25}{16}$. Volume is multiplied by $\frac{125}{64}$.

49. For two similar solids, how are the ratios of their volumes and surface areas related? $\left(\frac{V_1}{V_2}\right)^2 = \left(\frac{A_1}{A_2}\right)^3$