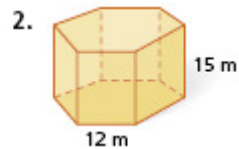
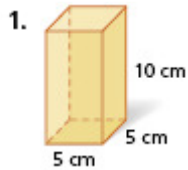


## Spatial Reasoning

## Surface Area and Volume

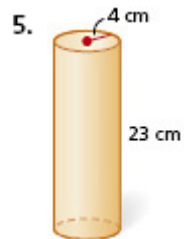
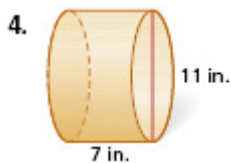
**10.2.1 Surface Area of Prisms and Cylinders**

Find the lateral area and surface area of each right prism. Round to the nearest tenth, if necessary.



3. a right equilateral triangular prism with base edge length 8 ft and height 14 ft

Find the lateral area and surface area of each right cylinder. Give your answers in terms of  $\pi$ .

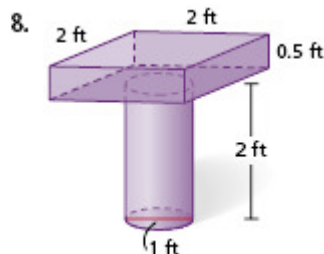
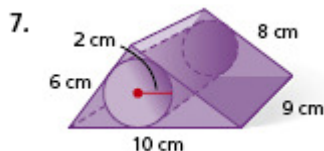


6. a cylinder with base circumference  $16\pi$  yd<sup>2</sup> and a height equal to 3 times the radius

Spatial Reasoning

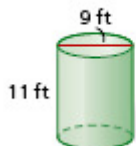
Surface Area and Volume

**Multi-Step** Find the surface area of each composite figure. Round to the nearest tenth.

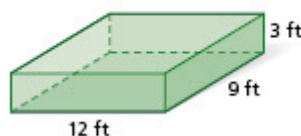


Describe the effect of each change on the surface area of the given figure.

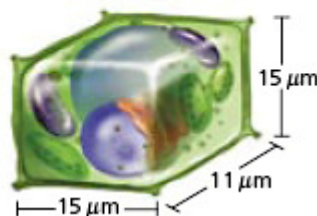
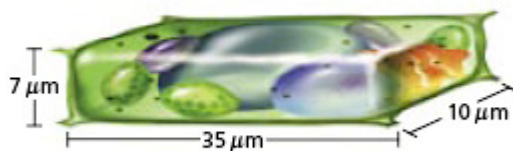
9. The dimensions are tripled.



10. The dimensions are doubled.



11. **Biology** Plant cells are shaped approximately like a right rectangular prism. Each cell absorbs oxygen and nutrients through its surface. Which cell can be expected to absorb at a greater rate? (*Hint: 1  $\mu\text{m}$  = 1 micrometer = 0.000001 meter*)



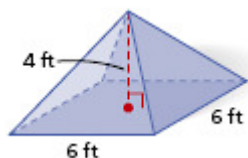
## Spatial Reasoning

## Surface Area and Volume

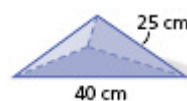
**10.2.2 Surface Area of Pyramids and Cones**

Find the lateral area and surface area of each regular pyramid.

12.



13.



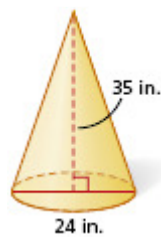
14. a regular hexagonal pyramid with base edge length 7 ft and slant height 15 ft

Find the lateral area and surface area of each right cone. Give your answers in terms of  $\pi$ .

15.



16.



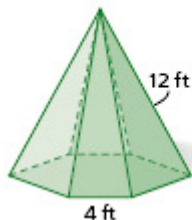
17. a cone with radius 8 m and height that is 1 m less than twice the radius

Spatial Reasoning

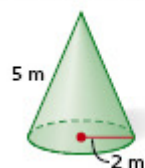
Surface Area and Volume

Describe the effect of each change on the surface area of the given figure.

18. The dimensions are divided by 3.

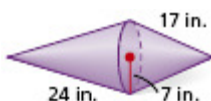


19. The dimensions are doubled.

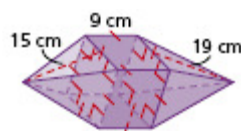


Find the surface area of each composite figure.

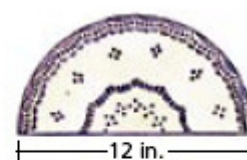
20.



21.



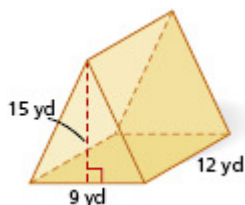
22. It is a tradition in England to celebrate May 1st by hanging cone-shaped baskets of flowers on neighbors' door handles. Addy is making a basket from a piece of paper that is a semicircle with diameter 12 in. What is the diameter of the basket?



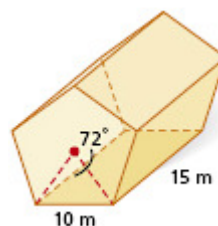
10.2.3 Volume of Prisms and Cylinders

Find the volume of each prism.

23.



24.



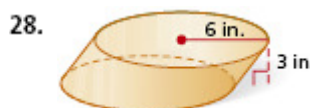
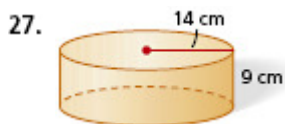
Spatial Reasoning

Surface Area and Volume

25. a square prism with a base area of  $49 \text{ ft}^2$  and a height 2 ft less than the base edge length

26. **Landscaping** Colin is buying dirt to fill a garden bed that is a 9 ft by 16 ft rectangle. If he wants to fill it to a depth of 4 in., how many cubic yards of dirt does he need? If dirt costs \$25 per  $\text{yd}^3$ , how much will the project cost? (*Hint:*  $1 \text{ yd}^3 = 27 \text{ ft}^3$ )

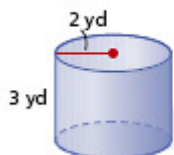
Find the volume of each cylinder. Give your answers both in terms of  $\pi$  and rounded to the nearest tenth.



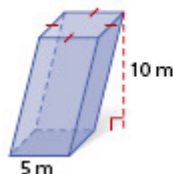
29. a cylinder with base area  $24\pi \text{ cm}^2$  and height 16 cm

Describe the effect of each change on the volume of the given figure.

30. The dimensions are multiplied by 5.



31. The dimensions are multiplied by  $\frac{3}{5}$ .

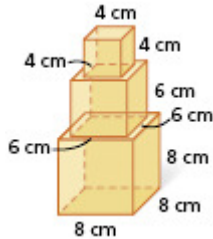


## Spatial Reasoning

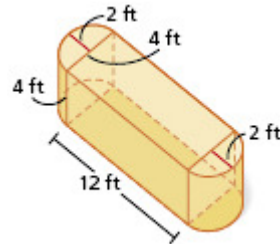
## Surface Area and Volume

Find the volume of each composite figure.

32.

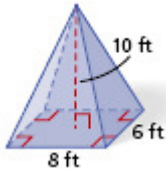


33.

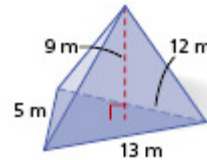
10.2.4 Volumes of Pyramids and Cones

Find the volume of each pyramid. Round to the nearest tenth, if necessary.

34.

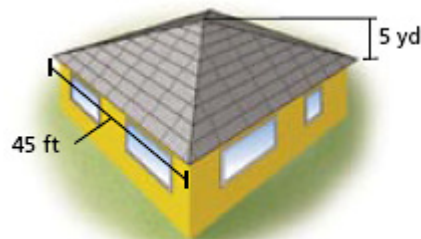


35.



36. a regular square pyramid with base edge length 12 ft and slant height 10 ft

37. **Carpentry** A roof that encloses an attic is a square pyramid with a base edge length of 45 feet and a height of 5 yards. What is the volume of the attic in cubic feet? In cubic yards?

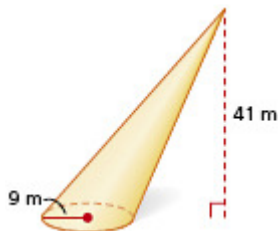


Spatial Reasoning

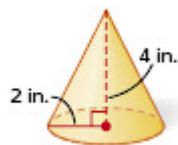
Surface Area and Volume

Find the volume of each cone. Give your answers both in terms of  $\pi$  and rounded to the nearest tenth.

38.



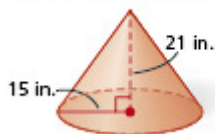
39.



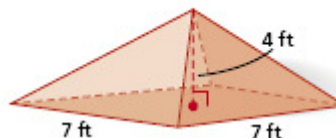
40. a cone with base area  $36\pi \text{ ft}^2$  and a height equal to twice the radius

Describe the effect of each change on the volume of the given figure.

41. The dimensions are multiplied by  $\frac{1}{3}$ .

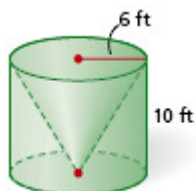


42. The dimensions are multiplied by 6.

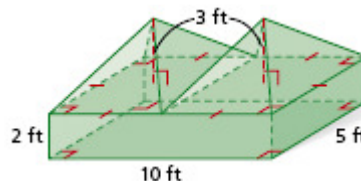


Find the volume of each composite figure. Round to the nearest tenth, if necessary.

43.



44.



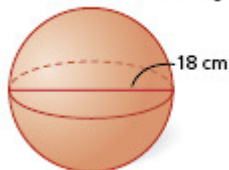
Spatial Reasoning

Surface Area and Volume

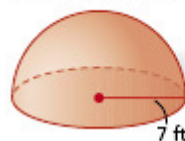
**10.2.5 Spheres**

Find each measurement. Give your answers in terms of  $\pi$ .

45. the volume of the sphere



46. the volume of the hemisphere



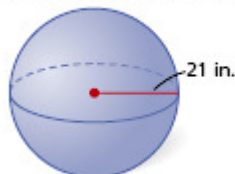
47. the diameter of a sphere with volume  $7776\pi \text{ in}^3$

48. **Jewelry** The size of a cultured pearl is typically indicated by its diameter in mm. How many times as great is the volume of the 9 mm pearl as the volume of the 6 mm pearl?

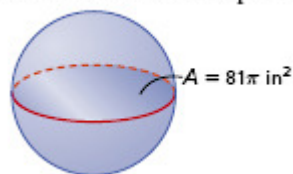


Find each measurement. Give your answers in terms of  $\pi$ .

49. the surface area of the sphere



50. the surface area of the sphere





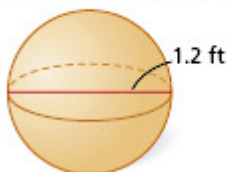
Spatial Reasoning

Surface Area and Volume

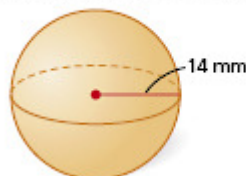
51. the volume of a sphere with surface area  $625\pi \text{ m}^2$

Describe the effect of each change on the given measurement of the figure.

52. surface area  
The dimensions are multiplied by  $\frac{1}{5}$ .



53. volume  
The dimensions are multiplied by 6.



Find the surface area and volume of each composite figure.

