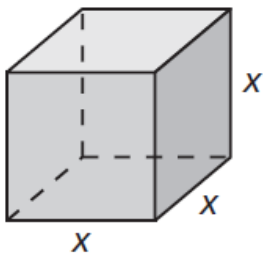


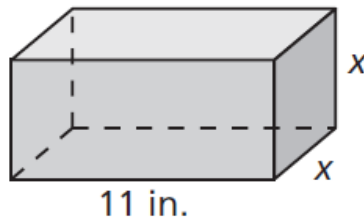
Use the diagram and the given surface area to find the value of x .

1. $SA = 1350 \text{ in.}^2$



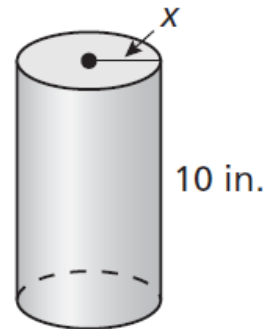
Cube

2. $SA = 270 \text{ in.}^2$



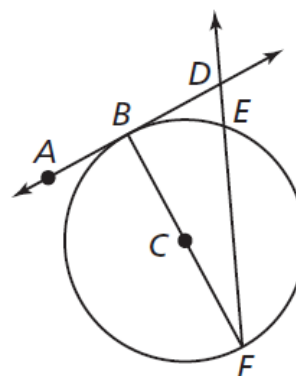
Rectangular solid

3. $SA = 78\pi \text{ in.}^2$



Cylinder

Tell whether the line, ray, or segment is best described as a radius, chord, diameter, secant, or tangent of $\odot C$.

1. \overline{CF} 2. \overline{AB} 3. \overline{FB} 4. \overline{EF} 5. \overline{DF} 6. \overline{BC} 

Essential Question

How can you find the surface area and the volume of a sphere?

Work with a partner. Remove the covering from a baseball or softball.



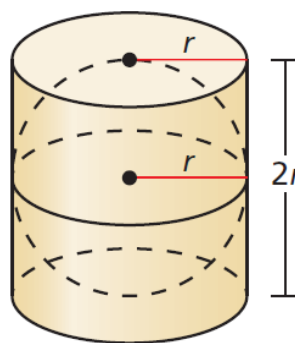
You will end up with two “figure 8” pieces of material, as shown above. From the amount of material it takes to cover the ball, what would you estimate the surface area S of the ball to be? Express your answer in terms of the radius r of the ball.

$S =$ Surface area of a sphere

Use the Internet or some other resource to confirm that the formula you wrote for the surface area of a sphere is correct.

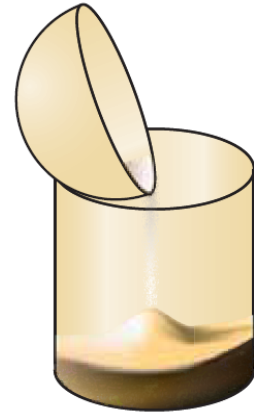
Work with a partner. A cylinder is circumscribed about a sphere, as shown. Write a formula for the volume V of the cylinder in terms of the radius r .

$V =$ Volume of cylinder



When half of the sphere (a *hemisphere*) is filled with sand and poured into the cylinder, it takes three hemispheres to fill the cylinder. Use this information to write a formula for the volume V of a sphere in terms of the radius r .

$V =$ Volume of a sphere



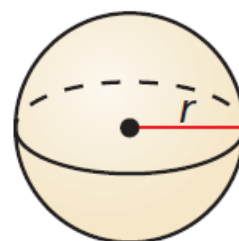
Core Concept

Surface Area of a Sphere

The surface area S of a sphere is

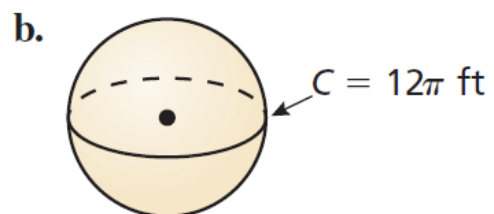
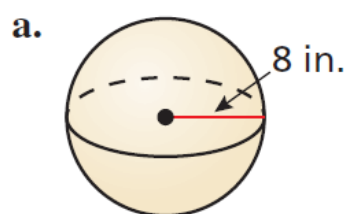
$$S = 4\pi r^2$$

where r is the radius of the sphere.

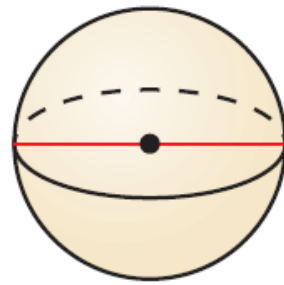


$$S = 4\pi r^2$$

Find the surface area of each sphere.

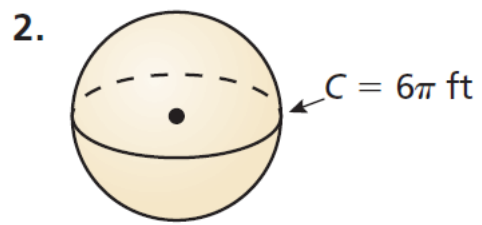
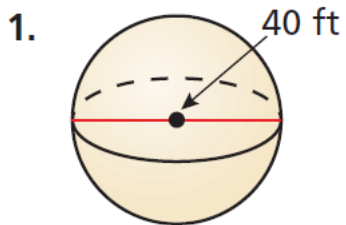


Find the diameter of the sphere.

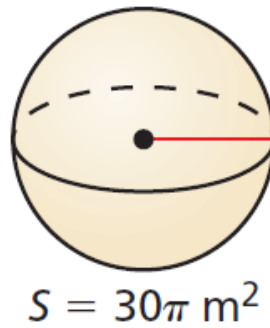


$$S = 20.25\pi \text{ cm}^2$$

Find the surface area of the sphere.



3. Find the radius of the sphere.



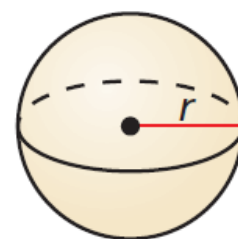
Core Concept

Volume of a Sphere

The volume V of a sphere is

$$V = \frac{4}{3}\pi r^3$$

where r is the radius of the sphere.



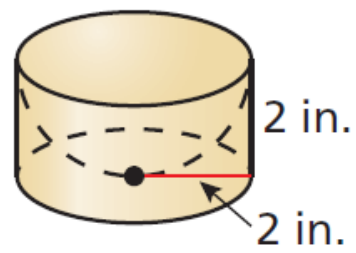
$$V = \frac{4}{3}\pi r^3$$

Find the volume of the soccer ball.



The surface area of a sphere is 324π square centimeters. Find the volume of the sphere.

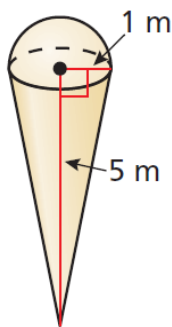
Find the volume of the composite solid.



4. The radius of a sphere is 5 yards. Find the volume of the sphere.

5. The diameter of a sphere is 36 inches. Find the volume of the sphere.

6. The surface area of a sphere is 576π square centimeters. Find the volume of the sphere.



7. Find the volume of the composite solid at the left.

- **3-2-1:** Hand out a *3-2-1* reflection sheet as described on page T-214.