LESSON 12.6

NAME Key DATE

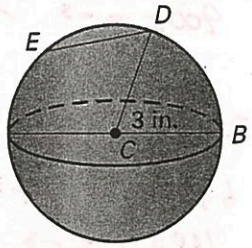
Practice A

For use with pages 759–765

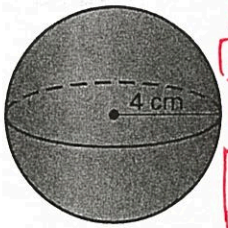
$S.A. = 4\pi r^2$ $V = \frac{4\pi r^3}{3}$

Use the diagram at the right.

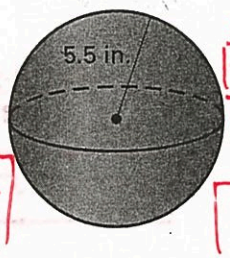
1. Name a chord of the sphere. $\overline{ED}$
2. Name a segment that is a radius of the sphere. $\overline{AC}$ or $\overline{CB}$ or $\overline{CD}$
3. Name a segment that is a diameter of the sphere. $\overline{AB}$
4. Find the circumference of the great circle that contains A and B. 6π in
5. Find the surface area of the sphere. $S.A. = 4\pi(3)^2$ $S.A. = 36\pi$ in^2
6. Find the volume of the sphere. $V = \frac{4\pi(3)^3}{3}$ $V = 36\pi$ in^3



Find the surface area of the sphere. FIND VOLUME. LEAVE IN π.

7. 

$S.A. = 4\pi(4)^2$ $S.A. = 64\pi$ cm^2 $V = \frac{4\pi(4)^3}{3}$ $V = \frac{256\pi}{3}$ cm^3

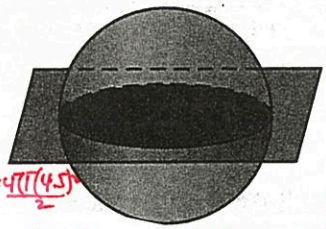
8. 

$S.A. = 4\pi(5.5)^2$ $S.A. = 121\pi$ in^2 $V = \frac{4\pi(5.5)^3}{3}$ $V = \frac{665.5\pi}{3}$ in^3

9.

$r = 6$ cm $S.A. = 4\pi(6)^2$ $S.A. = 144\pi$ cm^2 $V = \frac{4\pi(6)^3}{3}$ $V = 288\pi$ cm^3

In Exercises 10–13, use the diagram at the right. The center of the sphere is C and its circumference is 9π inches.



10. What is half of the sphere called? HEMISPHERE
11. Find the radius of the sphere. $C = 9\pi$ $9\pi = 2\pi r$ 4.5 in $= r$ → $D = 9$ in
12. Find the diameter of the sphere.
13. Find the surface area of half the sphere. $S.A. = \frac{4\pi(4.5)^2}{2}$ $S.A. = 40.5\pi + \pi(4.5)^2$ → $S.A. = 60.75\pi$ in^2

Find the volume of the sphere. FIND SURFACE AREA. LEAVE IN π.

14.

$S.A. = 4\pi(7)^2$ $S.A. = 196\pi$ in^2 $V = \frac{4\pi(7)^3}{3}$ $V = \frac{1372\pi}{3}$ in^3

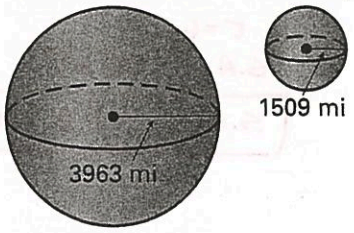
15.

$S.A. = 4\pi(5.1)^2$ $S.A. = 104.04\pi$ cm^2 $V = \frac{4\pi(5.1)^3}{3}$ $V = 176.868\pi$ cm^3

16.

$S.A. = 4\pi(1.25)^2$ $S.A. = 6.25\pi$ in^2 $V = \frac{4\pi(1.25)^3}{3}$ $V = \frac{7.8125\pi}{3}$ in^3

17. ***Earth and Mercury*** The mean radius of Earth is approximately 3963 miles. The mean radius of Mercury is 1509 miles. How does the surface area of Mercury compare to the surface area of Earth?



$S.A._{EARTH} = 4\pi(3963)^2 = 62821476\pi$ m^2

$S.A._{MERCURY} = 4\pi(1509)^2 = 9108324\pi$ m^2

$5371\,3152\,\pi$ m^2

Lesson 12.6

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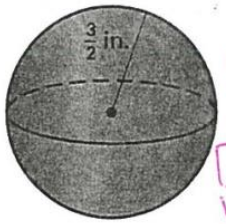
Practice B

For use with pages 759–765

Find the surface area and the volume of the sphere.

1. 

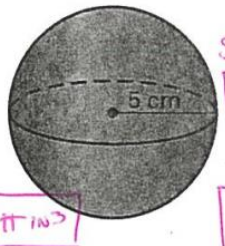
$r = \frac{3}{2} = 1.5$

$SA = 4\pi(\frac{3}{2})^2$

$SA = 4\pi(\frac{9}{4})$

$SA = 9\pi \text{ in}^2$

$V = \frac{4\pi(\frac{3}{2})^3}{3} = \frac{9}{2}\pi \text{ in}^3$

2. 

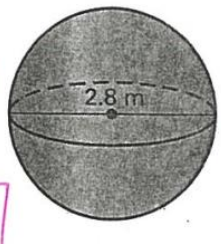
$r = 5$

$SA = 4\pi(5)^2$

$SA = 100\pi \text{ cm}^2$

$V = \frac{4\pi(5)^3}{3}$

$V = \frac{500\pi}{3} \text{ cm}^3$

3. 

$d = 2.8$

$r = 1.4$

$SA = 4\pi(1.4)^2$

$SA = 7.84\pi \text{ m}^2$

$V = \frac{4\pi(1.4)^3}{3}$

$V = \frac{10.976\pi}{3} \text{ m}^3$

Complete the table below. Leave your answers in terms of π.

$C = 2\pi r$ $SA = 4\pi r^2$ $V = 4\pi r^3/3$

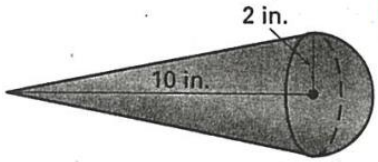
	Radius of sphere	Circumference of great circle	Surface area of sphere	Volume of sphere
4.	10 mm	20π mm	400π mm^2	$4000\pi/3$ mm^3
5.	18 mm	36π in.	1296π in^2	7776π in^3
6.	24 cm	48π cm	2304π cm^2	18432π cm^3
7.	5 yd	10π yd	100π yd^2	$\frac{500}{3}\pi$ yd^3

Find the surface area of the solid and the volume of the solid. The cylinder and cone are right. Round your results to two decimal places.

8.

$S = 452.39 \text{ cm}^2$

$V = 469.14 \text{ cm}^3$

9. 

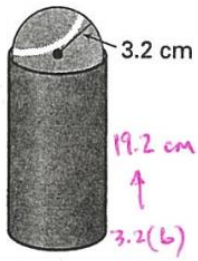
$SA = 89.21 \text{ in}^2$

$V = 58.64 \text{ in}^3$

Tennis Ball **In Exercises 10 and 11, consider a tennis ball with a radius of 3.2 centimeters.**

10. Find the surface area and volume of the tennis ball.

11. Tennis balls are often sold in a can of three. Assuming that the balls are packed tightly so that they touch the lateral side and the bases, determine the amount of volume in the can that is not taken up by the tennis balls.



10 $SA = 4\pi(3.2)^2$

$SA = 40.96\pi \text{ cm}^2$

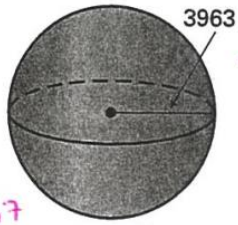
$V = \frac{4\pi(3.2)^3}{3}$

$V = 137.19 \text{ cm}^3$ with $\pi = 3.14$

Earth **In Exercises 12 and 13, Earth has an equatorial radius of approximately 3963 miles.**

12. Seventy percent (0.7) of Earth's surface is covered with water. Find the approximate surface area of Earth that is water.

13. Find the volume of Earth.



12 $SA = 4\pi(3963)^2$

$= 62821476\pi$

$= (62821476\pi)(.7)$

$= 43975033.2\pi \text{ mi}^2$

13 $V = \frac{4\pi(3963)^3}{3}$

$V = 2.607111583 \times 10^{11} \text{ mi}^3$

with $\pi = 3.14$

11 $r = 3.2$ $h = 19.2$

$V = \pi(3.2)^2(19.2)$ cylinder

$V = 196.608\pi$

$V = 617.34912$

with $\pi = 3.14$

empty space $= 617.34912 - \frac{1}{3}(137.19)$

$= 571.77912 \text{ cm}^3$