

Warm-Up

1. Find the height and slant height of the pyramid if the volume of the pyramid is 4096 in³.

$V = \frac{Bh}{3}$
 $4096 = \frac{1024h}{3} \cdot 3$
 $12288 = 1024h$
 $12 = h$
 $12^2 + 16^2 = l^2$
 $400 = l^2$
 $20 = l$
20 in
12 in

Warm-Up

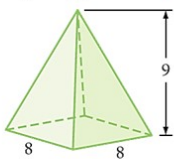
2. Find the volume of a cone with a diameter of 20 cm and a height of 16 cm.

ANSWERS

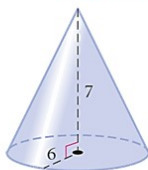
11.3 Exercises

Find the volume of each solid named in Exercises 1–6. All measurements are in centimeters.

1. Square pyramid 192 cm³

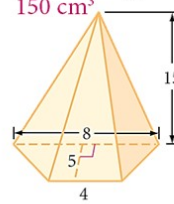


2. Cone 84π cm³ ≈ 263.9 cm³

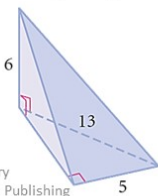


168π

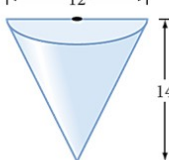
3. Trapezoidal pyramid 150 cm³



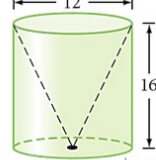
4. Triangular pyramid 60 cm³



5. Semicircular cone 84π cm³ ≈ 263.9 cm³



6. Cylinder with cone removed 384π cm³ ≈ 1206 cm³



ANSWERS

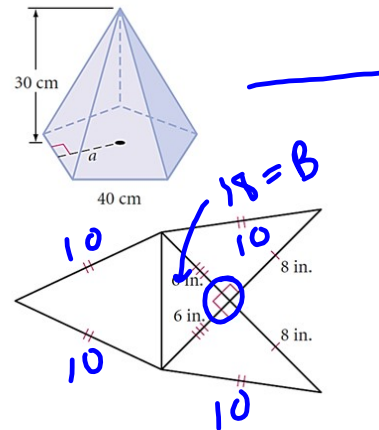
11.3 Exercises

14. Bretislav has designed a crystal glass sculpture. Part of the piece is in the shape of a large regular pentagonal pyramid, shown at right. The apothem of the base measures 27.5 cm. How much will this part weigh if the glass he plans to use weighs 2.85 grams per cubic centimeter?

78,375 grams

15. Jamala has designed a container that she claims will hold 50 in³. The net is shown at right. Check her calculations. What is the volume of the solid formed by this net? *h*

48 in³



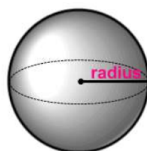
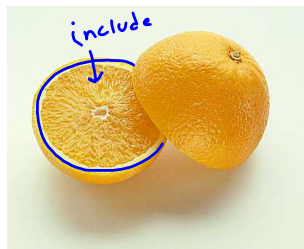
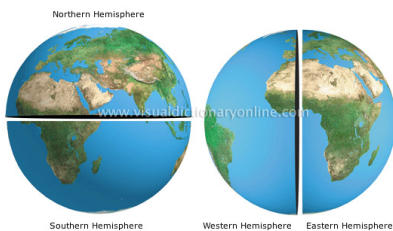
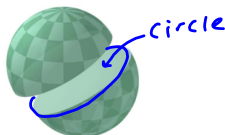
Sections 11.6 and 11.7
Surface Area and Volume of Spheres



SPHERE: A solid, round figure, where all points on the surface are the same distance from its center.



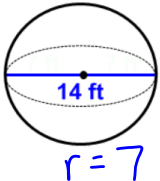
HEMISPHERE: half of a sphere.

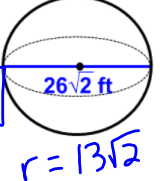


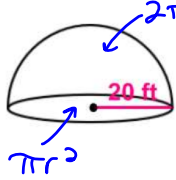
SURFACE AREA OF A SPHERE = $4\pi(\text{radius})^2$

$SA = 4\pi r^2$

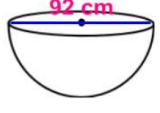
ExamplesFind the surface area of the sphere or hemisphere.

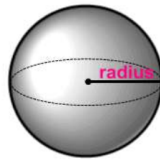
1.  $SA = 4\pi(7)^2$
 $SA = 196\pi \text{ ft}^2$
 $r = 7$

2.  $SA = 4\pi(13\sqrt{2})^2$
 $SA = 1352\pi \text{ ft}^2$
 $r = 13\sqrt{2}$

3. 
 $2\pi(20)^2 + \pi(20)^2$
 $800\pi + 400\pi = 1200\pi \text{ ft}^2$

 $V_{\text{Hemisphere}} = 3\pi r^2$
 $= 3\pi(20)^2 = 1200\pi \text{ ft}^3$

4. 
 $SA = 3\pi r^2$
 $SA = 3\pi(46)^2$
 $SA = 6348\pi \text{ cm}^2$



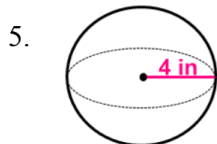
^
x^y

VOLUME OF A SPHERE = $\frac{4\pi(\text{radius})^3}{3}$

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

Examples

Find the volume.



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

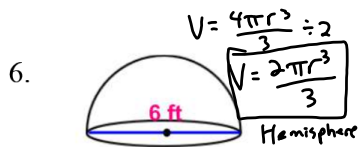
$$V = \boxed{85.\bar{3}\pi \text{ in}^3}$$

or

$$\boxed{85\frac{1}{3}\pi \text{ in}^3}$$

or

$$\boxed{\frac{256\pi}{3} \text{ in}^3}$$

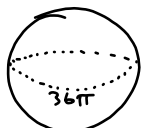


$$V = \frac{4\pi(3)^3}{3}$$

$$V = 36\pi \text{ ft}^3 \text{ (whole sphere)}$$

$$V_{\text{Hemisphere}} = \frac{36\pi}{2} = \boxed{18\pi \text{ ft}^3}$$

7. Circumference of ~~20~~ = 36π cm.
Sphere



$$V = \frac{4\pi(18)^3}{3}$$

$$C = 2\pi r$$

$$36\pi = 2\pi r$$

$$18 = r$$

$$V = \boxed{7776\pi \text{ cm}^3}$$

8. Surface Area of a Sphere = $900\pi \text{ ft}^2$.

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

$$900\pi = 4\pi r^2$$

$$225 = r^2$$

$$15 = r$$

$$V = \frac{4\pi(15)^3}{3}$$

$$V = \boxed{4500\pi \text{ ft}^3}$$

Assignment: 11.6 and 11.7 SA and Volume of Spheres HW