LESSON MAKER PRO

Volume in Action

Find the space inside everyday objects.

GRADE 8 · 8.GM.D.30

8.GM.D.30 "Use formulas to calculate the volumes of three-dimensional figures (cylinders, cones, and spheres) to solve real-world problems."

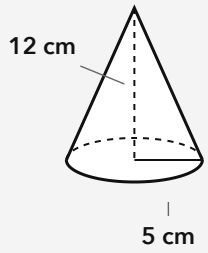
NAME _____ DATE _____

CHOOSE THE FORMULA

For a cylinder, V = pi r^2h. For a cone, V = (1/3)pi r^2h, and for a sphere, V = (4/3)pi r^3. Use the radius and give each answer in cubic units.

WORKED EXAMPLE

Find the volume of the cone shown. Give an exact answer in terms of pi.

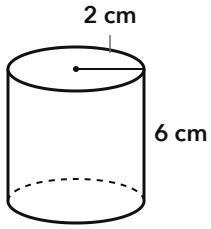


1. V = (1/3)pi r^2h
2. V = (1/3)pi$(5)^2$(12)
3. V = (1/3)pi(25)(12) = 100pi

Answer: 100pi cm^3

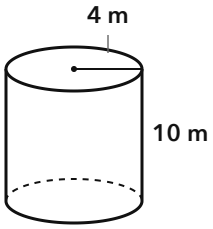
PRACTICE 6 problems

1 A cylindrical jar has the dimensions shown. What is its capacity? Give an exact answer in terms of pi.



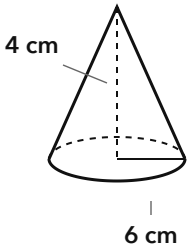
ANSWER _____

2 Find the volume of the cylindrical tank shown. Give an exact answer in terms of pi.



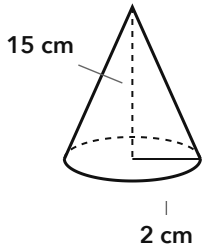
ANSWER _____

3 Find the volume of the cone shown. Give an exact answer in terms of pi.



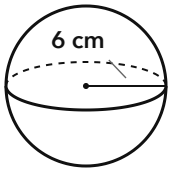
ANSWER _____

4 A cone-shaped cup has the dimensions shown. What is its capacity? Give an exact answer in terms of pi.



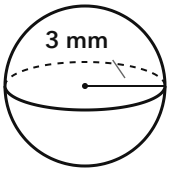
ANSWER _____

5 Find the volume of the sphere shown. Give an exact answer in terms of pi.



ANSWER _____

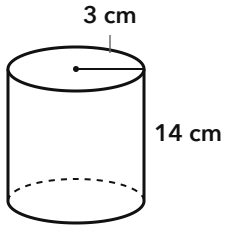
6 Find the volume of the spherical bead shown. Give an exact answer in terms of pi.



ANSWER _____

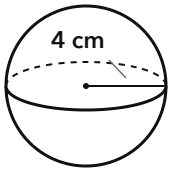
APPLY IT Show your work

1 A reusable water bottle has a cylindrical interior with the dimensions shown. How much water can it hold when full? Give an exact answer in terms of pi.



ANSWER _____

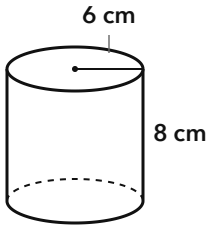
2 A shop makes solid spherical stress balls with the radius shown. How much material is needed for one ball? Give an exact answer in terms of pi.



ANSWER _____

CHALLENGE One step up

A cone and the cylinder shown have the same radius and height. How much greater is the cylinder's volume than the cone's volume? Show your calculation and give an exact answer in terms of pi.



WORK SPACE AND ANSWER

ANSWER KEY

Volume in Action

GRADE 8 · 8.GM.D.30

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A cylindrical jar has the dimensions shown. What is its capacity? Give an exact answer in terms of pi.	**24pi cm^3**
2	Find the volume of the cylindrical tank shown. Give an exact answer in terms of pi.	**160pi m^3**
3	Find the volume of the cone shown. Give an exact answer in terms of pi.	**48pi cm^3**
4	A cone-shaped cup has the dimensions shown. What is its capacity? Give an exact answer in terms of pi.	**20pi cm^3**
5	Find the volume of the sphere shown. Give an exact answer in terms of pi.	**288pi cm^3**
6	Find the volume of the spherical bead shown. Give an exact answer in terms of pi.	**36pi mm^3**

PART 2 · APPLY IT

1. **126pi cm^3** Use the cylinder formula: V = pi(3)^2(14) = 126pi cm^3.
2. **256pi/3 cm^3** Use the sphere formula: V = (4/3)pi(4)^3 = 256pi/3 cm^3.

CHALLENGE

Cylinder: pi(6)^2(8) = 288pi cm^3. Cone: (1/3)pi(6)^2(8) = 96pi cm^3. Difference: 192pi cm^3.

Accept equivalent exact expressions in terms of pi. Check that students use cubic units and, in the challenge, subtract the cone's volume from the cylinder's.