

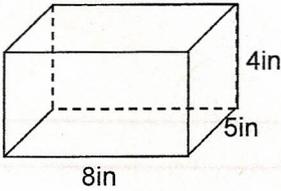
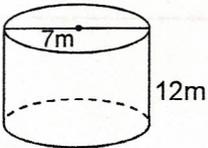
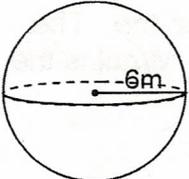
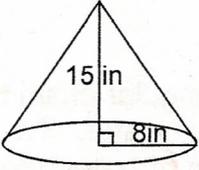
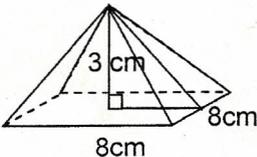
**GEOMETRY**  
**FCAT VOLUME**

NAME Key  
DATE \_\_\_\_\_ PER. \_\_\_\_\_

Using a copy of the **FCAT Mathematics Reference Sheet**, write the **formula** that you would use to find the **volume** of the indicated solids and **identify** each of the **variables**.

Solid	Volume Formula	Variables
1. Rectangular Prism	$V = lwh$	$l = \text{length}, w = \text{width}, h = \text{height}$
2. Right Circular Cylinder	$V = \pi r^2 h$	$r = \text{radius}, h = \text{height}$
3. Right Square Pyramid	$V = \frac{1}{3} lwh$	$l = \text{length}, w = \text{width}, h = \text{height}$
4. Right Circular Cone	$V = \frac{1}{3} \pi r^2 h$	$r = \text{radius}, h = \text{height}$
5. Sphere	$V = \frac{4}{3} \pi r^3$	$r = \text{radius}$

Use the **formulas** listed above to find the **volume** of the indicated solids. Make sure you a) identify the **value of each variable** and b) use the information in a) to find the volume. (In the third column, you must write the formula, substitute each variable, and simplify to get the answer.)

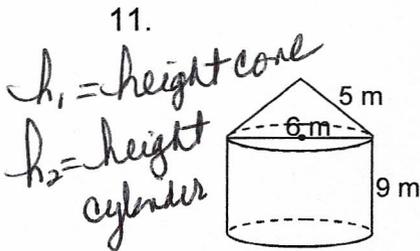
Question	Indicate the value of each variable.	Find the volume (Leave answer in terms of $\pi$ )
6. 	$l = 8 \text{ in}$ $w = 5 \text{ in}$ $h = 4 \text{ in}$	Formula $V = lwh$ Substitute $V = (8)(5)(4)$ Simplify $V = 160$ Answer $V = 160 \text{ in}^3$
7. 	$r = 7$ $h = 12$	Formula $V = \pi r^2 h$ Substitute $V = \pi (7^2)(12)$ Simplify $V = \pi (49)(12)$ Answer $V = 588 \pi \text{ m}^3$
8. 	$r = 6$	Formula $V = \frac{4}{3} \pi r^3$ Substitute $V = \frac{4}{3} \pi (6^3)$ Simplify $V = \frac{4}{3} \pi (216)$ Answer $V = 288 \pi \text{ m}^3$
9. 	$r = 8$ $h = 15$	Formula $V = \frac{1}{3} \pi r^2 h$ Substitute $V = \frac{1}{3} \pi (8^2)(15)$ Simplify $V = \frac{1}{3} \pi (64)(15)$ Answer $V = 320 \pi \text{ in}^3$
10. 	$l = 8$ $w = 8$ $h = 3$	Formula $V = \frac{1}{3} lwh$ Substitute $V = \frac{1}{3} (8)(8)(3)$ Simplify $V = \frac{1}{3} (192)$ Answer $V = 64 \text{ cm}^3$

**Question**

**Indicate the value of each variable.**

**Find the volume**

Leave answer in terms of  $\pi$ .



a) Identify the two solids that make up the solid.

Cone & Cylinder

Hint: Use the Pythagorean Theorem to find the missing value.

$r = 3\text{ m}$

$h_1(\text{cone}) = 4\text{ m}$   $h_2(\text{cyl}) = 9\text{ m}$

Formula

$V = \pi r^2 h_2 + \frac{1}{3} \pi r^2 h_1$

Substitute

$V = \pi(3^2)(9) + \frac{1}{3}\pi(3^2)(4)$

Simplify

$V = 81\pi + 12\pi$

Answer

$V = 93\pi\text{ m}^3$

12.

a) Identify the two solids that make up the solid.

hemisphere & cone

Hint: Use the Pythagorean Theorem to find the missing value.

$r = 5$

$h = 12$

Formula

$V = \frac{1}{2} \left( \frac{4}{3} \pi r^3 \right) + \frac{1}{3} \pi r^2 h$

Substitute

$V = \frac{2}{3} \pi (5)^3 + \frac{1}{3} \pi (5^2)(12)$

Simplify

$V = \frac{250\pi}{3} + 100\pi$

Answer

$V = \frac{550\pi}{3}\text{ m}^3$

13.

a) Identify the two solids that make up the solid.

hemisphere & cylinder

$r = 6\text{ ft}$

$h = 9\text{ ft}$

Formula

$V = \pi r^2 h + \frac{2}{3} \pi r^3$

Substitute

$V = \pi(6^2)(9) + \frac{2}{3} \pi(6^3)$

Simplify

$V = 324\pi + 144\pi$

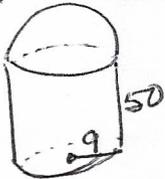
Answer

$V = 468\pi\text{ ft}^3$

Find the indicated **volume** in each problem.

14. A silo is in the shape of a cylinder with a **hemisphere** (half of a sphere) on top. The diameter of the silo is 18 feet. The height of the cylindrical part is 50 feet. What is the volume of the entire silo? Show all work!! Use  $\pi \approx 3.14$ . ☺

$d=18$   
 $r=9$



$V = \pi r^2 h + \frac{2}{3} \pi r^3$   
 $= \pi(9^2)(50) + \frac{2}{3} \pi(9)^3$   
 $= 4050\pi + 486\pi$

$4050(3.14) + 486(3.14)$   
 $\text{or}$   
 $4536(3.14)$   
 $= \boxed{14,243.04\text{ ft}^3}$

15. Elmo bought a new fish tank for his pet fish, Dorothy. The tank is a rectangular prism that measures 30 in by 12 in by 18 in. Elmo leaves 2 inches on the top without water. If a gallon is equivalent to 231 cubic inches, approximately how many gallons of water does Dorothy have to swim in? Show all work!! ☺

$V = 30 \times 12 \times 16$   
 $= 5760\text{ in}^3$

$\frac{5760}{231} \approx 24.9\text{ gallons}$   
 $\approx 25\text{ gallons}$