

# Grade 8 · Volume of Cylinders, Cones and Spheres · Worksheet

Common Core 8.G.C.9 · mathovore.fr

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_ Score: \_\_\_\_\_

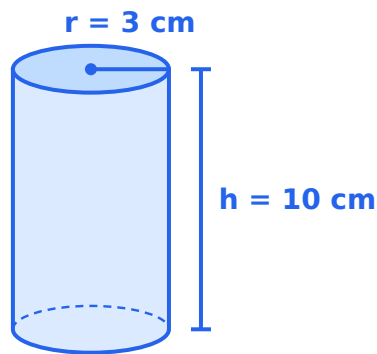
These 23 problems practice standard 8.G.C.9: finding the volume of cylinders, cones and spheres from a radius or a diameter, working backward to a missing dimension, and solving real-world problems. They go from one-step formula substitution to multi-step word problems.

Give each answer in cubic units, in terms of  $\pi$  or with 3.14 as directed.

## Grade 8 Common Core: 8.G.C.9

### Problem 1: Cylinder with radius and height

Find the volume of the cylinder. Leave the answer in terms of  $\pi$ .



A cylinder with radius 3 cm and height 10 cm.

### Problem 2: Cylinder using 3.14

A cylinder has a radius of 5 in and a height of 4 in. Use 3.14 for  $\pi$  to find its volume.

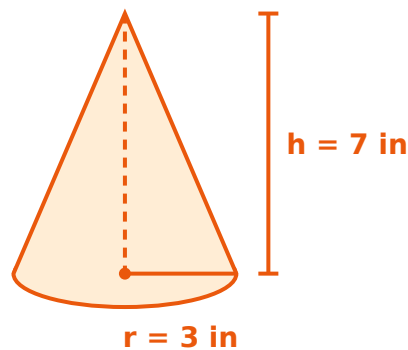
### Problem 3: Cylinder from the diameter

A cylinder has a diameter of 12 ft and a height of 7 ft. Find its volume in terms of  $\pi$ .

#### Problem 4: Cone with radius and height

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Find the volume of the cone in terms of  $\pi$ .



A cone with radius 3 in and height 7 in.

#### Problem 5: Cone using 3.14

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A cone has a radius of 6 cm and a height of 9 cm. Use 3.14 for  $\pi$  to find its volume.

#### Problem 6: Cone from the diameter

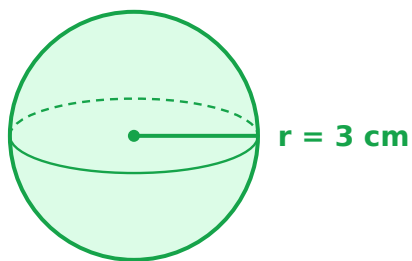
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A cone has a diameter of 10 m and a height of 12 m. Find its volume in terms of  $\pi$ .

#### Problem 7: Sphere with a given radius

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Find the volume of the sphere in terms of  $\pi$ .



A sphere with radius 3 cm.

#### Problem 8: Sphere using 3.14

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A sphere has a radius of 6 in. Use 3.14 for  $\pi$  to find its volume.

### Problem 9: Sphere from the diameter

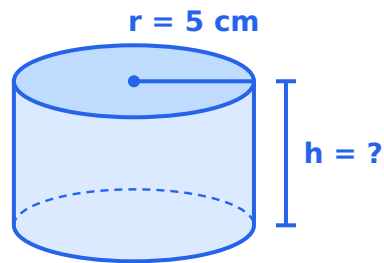
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A sphere has a diameter of 10 ft. Find its volume in terms of  $\pi$ , and then round to the nearest hundredth using 3.14.

### Problem 10: Find the height of a cylinder

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A cylinder has a volume of  $150\pi \text{ cm}^3$  and a radius of 5 cm. Find its height.



The volume is  $150\pi \text{ cm}^3$ ; the height is unknown.

### Problem 11: Find the radius of a cylinder

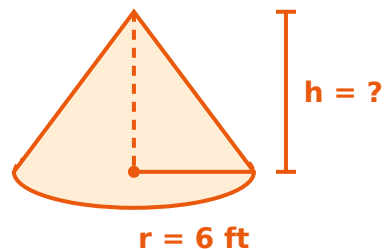
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A cylinder has a volume of  $245\pi \text{ in}^3$  and a height of 5 in. Find its radius.

### Problem 12: Find the height of a cone

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A cone has a volume of  $96\pi \text{ ft}^3$  and a radius of 6 ft. Find its height.



The volume is  $96\pi \text{ ft}^3$ ; the height is unknown.

### Problem 13: Find the radius of a sphere

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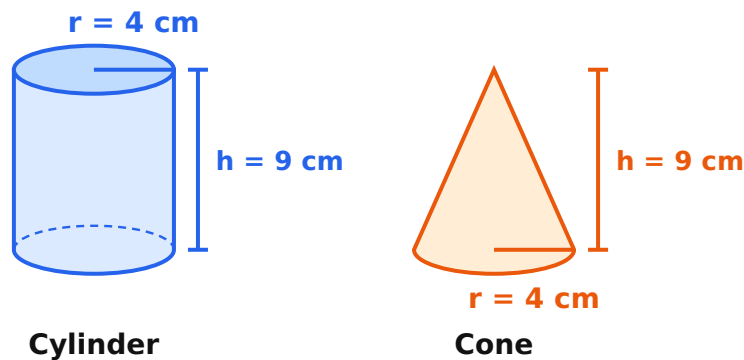
A sphere has a volume of  $288\pi \text{ cm}^3$ . Find its radius.

### Problem 14: Cylinder versus cone

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A cylinder and a cone both have a radius of 4 cm and a height of 9 cm. Find the volume of

each in terms of  $\pi$ , and tell how the two volumes compare.



A cylinder and a cone with the same radius and height.

### Problem 15: Volume of a hemisphere

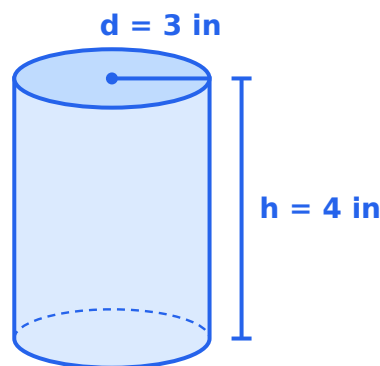
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A hemisphere is half of a sphere. A hemisphere-shaped dome has a radius of 9 m. Find its volume in terms of  $\pi$ .

### Problem 16: Soup can

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A soup can has a diameter of 3 in and a height of 4 in. Use 3.14 for  $\pi$  to find how much soup the can holds.



A soup can, diameter 3 in and height 4 in.

### Problem 17: Water storage tank

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A cylindrical water tank has a radius of 4 ft and a height of 10 ft. (a) Use 3.14 for  $\pi$  to find its volume. (b) A pump fills the tank at 40 cubic feet per minute. About how many minutes does it take to fill the empty tank? Round to the nearest tenth.

### Problem 18: Pile of sand

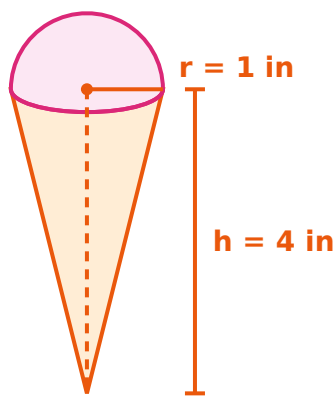
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A pile of sand is shaped like a cone with a radius of 6 ft and a height of 5 ft. (a) Find the volume in terms of  $\pi$ . (b) Use 3.14 to approximate it. (c) A dump truck carries 20 cubic feet of sand per load. How many loads are needed to move the whole pile?

### Problem 19: Ice cream cone with a scoop

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An ice cream cone has a radius of 1 in and a height of 4 in. A hemisphere-shaped scoop with the same radius sits on top. Find the total volume of ice cream and cone in terms of  $\pi$ , and then with 3.14.



A cone topped by a hemisphere.

### Problem 20: Basketball

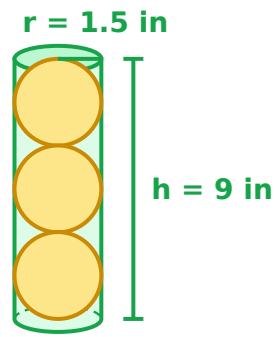
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A basketball has a diameter of 9 in. Use 3.14 for  $\pi$  to find the volume of air it holds, rounded to the nearest hundredth.

### Problem 21: Tennis ball can

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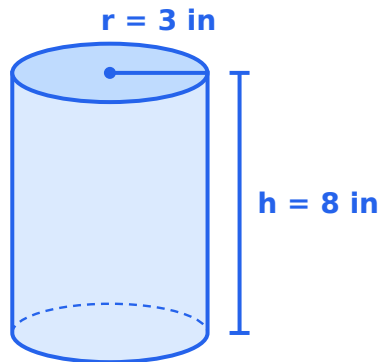
A can has a radius of 1.5 in and a height of 9 in, and holds 3 tennis balls, each with a radius of 1.5 in. Find the empty space in the can, in terms of  $\pi$  and then to the nearest tenth with 3.14.



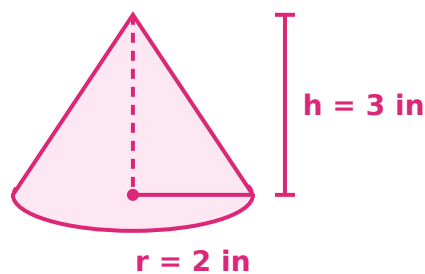
Three balls stacked in a can.

## Problem 22: Filling paper cups

A cylindrical jug has a radius of 3 in and a height of 8 in. Paper cups are cones with a radius of 2 in and a height of 3 in. How many full cups can be filled from a full jug?



The jug.



One paper cup.

## Problem 23: Reshaping a ball of clay

Priya rolls a ball of clay with a radius of 3 cm, then flattens it into a cylinder with a radius of 3 cm without losing any clay. How tall is the cylinder?