

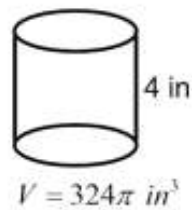
Solving for a radius in cones and cylinders

Solving for Radius of Cylinders and Cones

To solve for radius, use ESA to substitute and solve for r. You will need to first isolate r^2 then take the square root of both sides. $\sqrt{\square}$

- 1) The height of cylinder is 4 inches and the volume is $324\pi \text{ in}^3$, what is the radius of the cylinder?

$$\begin{aligned}V &= \pi r^2 h \\324\pi &= \pi r^2 \cdot 4 \\ \frac{324\pi}{\pi} &= \frac{4\pi r^2}{\pi} \\ \frac{324}{4} &= \frac{4r^2}{4} \\ \sqrt{81} &= \sqrt{r^2} \\ 9 &= r \\ \boxed{r = 9 \text{ in.}}\end{aligned}$$



Formulas	
Rectangular Prism:	$V = lwh$
Cylinder:	$V = \pi r^2 h$
Cone:	$V = \frac{1}{3}\pi r^2 h$
Sphere:	$V = \frac{4}{3}\pi r^3$

- 2) The volume of a cylinder is 197.9 cm^3 and the height is 7 cm . What is the radius rounded to the nearest whole centimeter?

$$V = \pi r^2 h$$

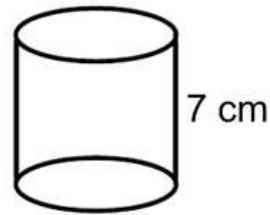
$$197.9 = \pi \cdot r^2 \cdot 7$$

$$\frac{197.9}{21.9911} = \frac{21.9911 \cdot r^2}{21.9911}$$

$$\sqrt{8.9990} = \sqrt{r^2}$$

$$2.9998 = r$$

$$r \approx 3 \text{ cm}$$



$$V \approx 197.9 \text{ cm}^3$$

- 3) What is the radius of a cone that has volume of 603.2 cm^3 and height of 12 cm ? (round to the nearest tenth of a centimeter)

$$V = \frac{1}{3} \pi r^2 h$$

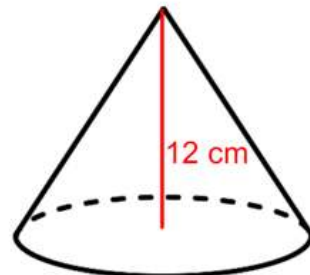
$$603.2 = \frac{1}{3} \cdot \pi \cdot r^2 \cdot 12$$

$$\frac{603.2}{12.5663} = \frac{12.5663 r^2}{12.5663}$$

$$\sqrt{48.0011} = \sqrt{r^2}$$

$$r \approx 6.928$$

$$r \approx 6.9 \text{ cm}$$



$$V \approx 603.2 \text{ cm}^3$$

- 4) The volume of a cylinder is 471.2 mm³ and the height is 6mm. What is the radius rounded to the nearest tenths place?

$$V = \pi r^2 h$$

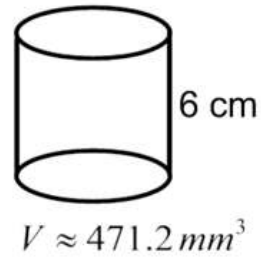
$$471.2 = \pi \cdot r^2 \cdot 6$$

$$\frac{471.2}{18.8495} = \frac{18.8495 r^2}{18.8495}$$

$$\sqrt{24.9979} = \sqrt{r^2}$$

$$4.999 \approx r$$

$r \approx 5.0 \text{ cm}$



- 5) The volume of a cone is $600\pi \text{ mm}^3$ and the height is 18mm. What is the radius?

$$V = \frac{1}{3} \pi r^2 h$$

$$\frac{600\pi}{\pi} = \frac{\frac{1}{3} \pi \cdot r^2 \cdot 18}{\pi}$$

$$600 = \frac{1}{3} \cdot r^2 \cdot \frac{18}{1}$$

$$\frac{600}{6} = \frac{6r^2}{6}$$

$$\sqrt{100} = \sqrt{r^2}$$

$r = 10 \text{ mm}$

$$\frac{600\pi}{\pi} = \frac{\frac{1}{3} \pi \cdot r^2 \cdot 18}{\pi}$$

$$\frac{1884.955}{18.8495} = \frac{18.8495 r^2}{18.8495}$$

$$= r^2$$

- 6) The volume of a cone is 58.9 cm^3 and the height is 9 cm . What is the radius rounded to the nearest tenths place?

$$V = \frac{1}{3} \pi r^2 h$$
$$58.9 = \frac{1}{3} \cdot \pi \cdot r^2 \cdot 9$$
$$\frac{58.9}{9.4247} = \frac{9.4247 r^2}{9.4247}$$
$$\sqrt{6.2494} = \sqrt{r^2}$$
$$2.499 \approx r$$
$$r \approx 2.5 \text{ cm}$$

Independent practice is 8 problems.

