

ACT Study Modules

Topic: Volume of Sphere and Cone

Video:

Volume of a sphere:

<https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-geometry/cc-8th-volume/v/volume-of-a-sphere>

Volume of a cone:

<https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-geometry/cc-8th-volume/v/volume-cone-example>

1. Determine the height of a cone when given the radius and the height.

The radius of a cone is 5 *inches* and the volume is 100π cubic inches. Determine the height of the cone.

$V = \frac{1}{3}\pi r^2 h$
$100\pi = \frac{1}{3}\pi(5^2)h$
$100\pi = \frac{1}{3}\pi(25)h$
$\frac{100\pi}{25\pi} = \frac{\frac{1}{3}\pi(25)h}{25\pi}$
$\left(\frac{3}{1}\right)^4 = \frac{1}{3}h\left(\frac{3}{1}\right)$
$12 = h$

2. Determine the radius of a sphere, given the volume. The volume of a volleyball is $12348\pi \text{ cm}^3$. Determine the radius.

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

$$12348\pi = \frac{4}{3}\pi r^3$$

$$\left(\frac{3}{4}\right)12348\pi = \frac{4}{3}\pi r^3 \left(\frac{3}{4}\right)$$

$$\frac{12348\pi}{\pi} = \frac{\pi r^3}{\pi}$$

$$12348 = r^3$$

$$\sqrt[3]{12348} = \sqrt[3]{r^3}$$

$$21 = r$$

The radius of a volleyball is 21 cm.

Practice:

<p>1. Find the volume of a cone if $r = 7$ miles and $h = 2$ miles.</p>	<p>2. Find the height of a cone that has a radius 4 m and a volume of 64π cubic meters.</p>
<p>3. Find the volume of a sphere if $r = 16$ inches. Leave your answer in terms of π.</p>	<p>4. The volume of a basketball is 972π cubic inches. Determine the radius.</p> <p>Bonus: if the NBA requires the diameter of the game balls to be 18.75 inches, is the basketball in this problem legal for the NBA?</p>