

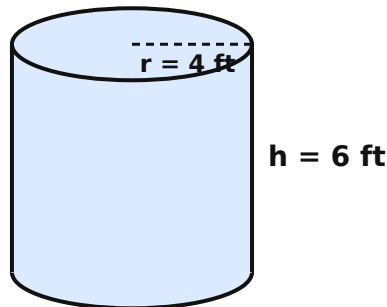
Grade 8 - Volume of Cylinders, Cones and Spheres - Answer Key

Common Core 8.G.C.9 · maths-pdf.fr/en/

This answer key gives a full worked solution for each of the 20 problems on the volume of cylinders, cones and spheres worksheet (Common Core 8.G.C.9). Compare each step with your own work, not only the final answer, and note any step where your method differed.

Grade 8 · Common Core State Standards: **8.G.C.9**

Exercise 1 - Cylinder volume



$$V = 96\pi \text{ ft}^3.$$

$$V = \pi \cdot 4^2 \cdot 6 = 96\pi.$$

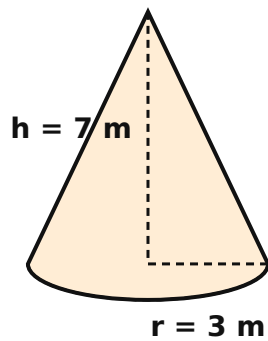
$$96\pi \text{ ft}^3$$

Exercise 2 - Cylinder from a diameter

$$\text{Radius} = 5. \quad V = 3.14 \cdot 25 \cdot 7 = 549.5.$$

$$549.5 \text{ cm}^3$$

Exercise 3 - Cone volume



$$V = 21\pi \text{ m}^3.$$

$$V = \frac{1}{3}\pi \cdot 9 \cdot 7 = 21\pi.$$

$$21\pi \text{ m}^3$$

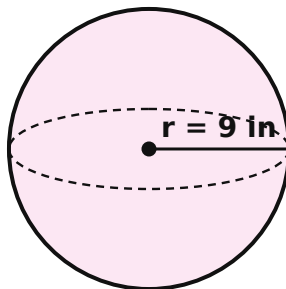
Exercise 4 - Cone from a diameter

$$\text{Radius} = 4. \quad V = \frac{1}{3}\pi \cdot 16 \cdot 9 = 48\pi.$$

$$48 \cdot 3.14 = 150.72.$$

$$48\pi \approx 150.72 \text{ in}^3$$

Exercise 5 - Sphere volume



$$V = 972\pi \text{ in}^3.$$

$$V = \frac{4}{3}\pi \cdot 9^3 = \frac{4}{3}\pi \cdot 729 = 972\pi.$$

$$972\pi \text{ in}^3$$

Exercise 6 - Sphere from a diameter

$$\text{Radius} = 6. V = \frac{4}{3}\pi \cdot 216 = 288\pi.$$

$$288 \cdot 3.14 = 904.32.$$

$$288\pi \approx 904.32 \text{ in}^3$$

Exercise 7 - Find the height

$$150\pi = \pi \cdot 25 \cdot h, \text{ so } h = 6.$$

6 cm

Exercise 8 - Find the cone height

$$100\pi = \frac{1}{3}\pi \cdot 25 \cdot h, \text{ so } 300 = 25h \text{ and } h = 12.$$

12 inches

Exercise 9 - Find the radius of a sphere

$$\frac{4}{3}\pi r^3 = \frac{256}{3}\pi, \text{ so } r^3 = 64.$$

4 units

Exercise 10 - Cylinder and cone

$$\text{Cylinder: } \pi \cdot 16 \cdot 9 = 144\pi. \text{ Cone: } \frac{1}{3} \cdot 144\pi = 48\pi.$$

The cone is one third of the cylinder

Exercise 11 - Hemisphere

$$\text{Half a sphere: } \frac{1}{2} \cdot \frac{4}{3}\pi \cdot 216 = 144\pi.$$

$$144\pi$$

Exercise 12 - Soup can

$$\text{Radius} = 3.5. \quad V = 3.14 \cdot 12.25 \cdot 4 = 153.86.$$

about 153.9 in³

Exercise 13 - Water tank

$$V = \pi \cdot 16 \cdot 10 = 160\pi.$$

$$160 \cdot 3.14 = 502.4.$$

$$160\pi \approx 502.4 \text{ ft}^3$$

Exercise 14 - Ice cream

$$\text{Cone: } \frac{1}{3}\pi \cdot 4 \cdot 6 = 8\pi.$$

$$\text{Scoop: } \frac{4}{3}\pi \cdot 8 = \frac{32}{3}\pi.$$

Cone 8π in³; scoop $\frac{32}{3}\pi$ in³

Exercise 15 - Soccer ball

$$V = \frac{4}{3} \cdot 3.14 \cdot 4.5^3 = \frac{4}{3} \cdot 3.14 \cdot 91.125 = 381.51.$$

about 381.5 in³

Exercise 16 - Grain silo

$$\text{Cylinder: } \pi \cdot 25 \cdot 20 = 500\pi. \quad \text{Hemisphere: } \frac{2}{3}\pi \cdot 125 = \frac{250}{3}\pi.$$

$$\text{Total: } 500\pi + \frac{250}{3}\pi = \frac{1750}{3}\pi.$$

$$\frac{1750}{3}\pi \approx 1831.7 \text{ ft}^3$$

Exercise 17 - Traffic cone

$$V = \frac{1}{3}\pi \cdot 36 \cdot 18 = 216\pi \approx 678.24.$$

about 678.24 in³

Exercise 18 - Swimming pool

$$V = \pi \cdot 36 \cdot 4 = 144\pi \approx 452.16.$$

about 452.2 ft³

Exercise 19 - Double the radius

Original: $\pi \cdot 4 \cdot 5 = 20\pi$. New ($r = 4$): $\pi \cdot 16 \cdot 5 = 80\pi$.

The volume is 4 times as large

Exercise 20 - Find the height with 3.14

$$502.4 = 3.14 \cdot 16 \cdot h = 50.24h, \text{ so } h = 10.$$

10 feet