



Volume of cones, cylinders and spheres

GRADE 8 MATH

Name _____

Date _____

Write $r =$ on your first line. Leave answers as multiples of π unless asked otherwise.

WORKED EXAMPLE

Cylinder $\pi r^2 h$; cone $\frac{1}{3}\pi r^2 h$; sphere $\frac{4}{3}\pi r^3$. Cone = $\frac{1}{3}$ of its cylinder; sphere = $\frac{2}{3}$ of its containing cylinder. Halve every diameter: r is squared or cubed, so the error is multiplied by 4 or 8.

1. A cylinder has diameter 10 and height 7. Find its volume as a multiple of π .

APPLICATION

Show your thinking

Answer

2. A cone has radius 6 and height 5. Find its volume.

APPLICATION

Show your thinking

Answer

3. A sphere has diameter 12. Find its volume.

APPLICATION

Show your thinking

Answer

4. A cone and a cylinder share a base and a height. The cone holds 200 ml. What does the cylinder hold?

APPLICATION

Show your thinking

Answer

5. A sphere of radius 5 sits in the smallest cylinder that contains it. Find both volumes and check the 2 : 3 relationship.

APPLICATION

Show your thinking

Answer

6. Sam finds a sphere's volume to be 4 times the correct answer. Could his error be using the diameter as the radius? Explain.

REASONING

Show your thinking

Answer

7. A cylindrical tank has diameter 4 m and height 3 m. How many litres does it hold? ($1 \text{ m}^3 = 1000 \text{ litres}$, and take π as 3.14.)

APPLICATION

Show your thinking

Answer

8. Why does using a diameter as a radius cost a factor of 4 on a cylinder but 8 on a sphere?

REASONING

Show your thinking

Answer