



Volume of cones, cylinders and spheres

GRADE 8 MATH

Name _____

Date _____

Write $r =$ on your first line. Leave answers as multiples of π . One skill: **volume of cones, cylinders and spheres.**

WORKED EXAMPLE

Cylinder: $V = \pi r^2 h$. **Cone:** $V = \frac{1}{3} \pi r^2 h$ — exactly a third of the cylinder on the same base with the same height. **Sphere:** $V = \frac{4}{3} \pi r^3$ — exactly two thirds of the cylinder that just contains it, so on one base a cylinder, sphere and cone stand as **3 : 2 : 1**. Every formula takes the **radius**, and questions usually give the **diameter**, so halve it first and write it down. Because r is squared or cubed, using a diameter as the radius makes a cylinder **4 times** too big and a sphere **8 times** too big.

1. A can has diameter 8 cm and height 10 cm. Find its volume, leaving your answer as a multiple of π .

APPLICATION

Show your thinking

Answer

2. A cone has the same base and height as that can. Find its volume.

APPLICATION

Show your thinking

Answer

3. Omar works out the can's volume as 640π . Explain what he did, and how the SIZE of his error shows it.

REASONING

Show your thinking

Answer

4. A sphere has radius 3 cm. Find its volume, and show that it is two thirds of the smallest cylinder that would contain it.

REASONING

Show your thinking

Answer