



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 = a third of its cylinder; sphere = two thirds of its containing cylinder. Halve every diameter first: r is squared or cubed, so a diameter used as a radius costs a factor of 4 or 8.

1. Write the three volume formulas.

FLUENCY

Show your thinking

Answer

2. A cylinder has radius 3 and height 10. Find its volume as a multiple of π .

FLUENCY

Show your thinking

Answer

3. Find the volume of a cone with radius 3 and height 10. Use your answer to item 2.

APPLICATION

Show your thinking

Answer

4. Find the volume of a sphere of radius 3.

APPLICATION

Show your thinking

Answer

5. A sphere of radius 3 sits inside the smallest possible cylinder. Find that cylinder's volume, and the ratio of sphere to cylinder.

APPLICATION

Show your thinking

Answer

6. A ball has diameter 6. Ella calculates its volume as 288π . What did she do, and by what factor is she out?

REASONING

Show your thinking

Answer

7. A sphere's radius is doubled. What happens to its volume? Explain using the formula.

REASONING

Show your thinking

Answer

8. A cone and a cylinder have the same base and height. The cylinder holds 1.5 litres. What does the cone hold?

APPLICATION

Show your thinking

Answer

9. Why is it worth remembering the cone and sphere formulas as relationships to the cylinder?

REASONING

Show your thinking

Answer