

Volume of Cylinders, Cones and Spheres: math test, Grade 8 – download the PDF

Suggested time: 45 minutes. Out of 20 points. Calculator allowed only when the problem says so.

1 Computing volumes

/ 4 pts

Calculators are allowed. Use $\pi \approx 3.14$. Give each volume in terms of π and approximately.

- a. Cylinder: radius **7 cm**, height **3 cm**.
- b. Cone: radius **9 mm**, height **10 mm**.
- c. Sphere: radius **15 m**.

2 True or false?

/ 3 pts

Say whether each statement is true or false, and justify in one sentence.

- a. A cone and a cylinder with the same base and height have the same volume.
- b. If the radius of a cone is doubled and its height stays the same, its volume doubles.
- c. The volume of a sphere is measured in cubic units.

3 Unknown dimensions

/ 3 pts

- A cylinder has radius **9 cm** and volume **$486\pi \text{ cm}^3$** . Find its height.
- A cone has height **12 cm** and volume **$64\pi \text{ cm}^3$** . Find its radius.

4 Paper cups

/ 3 pts

Calculators are allowed. A paper cup is a cone with radius **4 cm** and height **12 cm**. Use $\pi \approx 3.14$.

- Find the volume of one cup in **cm^3** .
- A bottle contains **1 L** of juice. How many cups can be filled completely?

5 A spinning top

/ 4 pts

Calculators are allowed. A toy is made of a cylinder with radius **6 cm** and height **10 cm**, with a cone of radius **6 cm** and height **8 cm** attached on top. Use $\pi \approx 3.14$.

- Find the volume of the cylinder.
- Find the volume of the cone.
- Find the total volume, exactly and to the nearest tenth.

6 A spherical tank

/ 3 pts

Calculators are allowed. A spherical tank has radius **5 ft**. Use $\pi \approx 3.14$ and **$1 \text{ ft}^3 \approx 7.48$** gallons.

- Find its volume to the nearest tenth of a cubic foot.
- About how many gallons does it hold? Round to the nearest whole gallon.



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