ALBERT

Name _____ Date _____

Volume of Cones, Cylinders and Spheres Worksheet

Grade 8 · Common Core 8.G.C.9

> Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Practice

Builds the skill step by step.

1. A cylinder has a radius of 3 cm and a height of 10 cm. What is its volume? Use 3.14 for π and round to the nearest tenth.

2. A cone has a radius of 3 cm and a height of 10 cm. What is its volume? Use 3.14 for π and round to the nearest tenth.

3. A sphere has a radius of 3 in. What is its volume? Use 3.14 for π and round to the nearest tenth.

4. Which formula gives the volume of a cone with radius r and height h?

   A. $V = \frac{4}{3}\pi r^3$

   B. $V = \pi r^2 h$

   C. $V = \frac{1}{3}\pi r^2 h$

   D. $V = 2\pi r h$

5. A cylinder has a diameter of 10 ft and a height of 4 ft. What is its volume? Use 3.14 for π and round to the nearest tenth.

6. A sphere has a radius of 6 cm. What is its volume? Use 3.14 for π and round to the nearest tenth.

7. A cone has a radius of 4 in. and a height of 9 in. What is its volume? Use 3.14 for π and round to the nearest tenth.

8. A cone and a cylinder have the same radius and the same height. How does the cone's volume compare with the cylinder's?

   A. It is the same.

   B. It is one half of the cylinder's.

   C. It is three times the cylinder's.

   D. It is one third of the cylinder's.

9. A cylinder has a radius of 2 m and a height of 7 m. What is its volume? Use 3.14 for π and round to the nearest tenth.

10. A sphere has a diameter of 2 in. What is its volume? Use 3.14 for π and round to the nearest tenth.

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On Level

Grade-level practice.

1. A soup can has a radius of 4 cm and a height of 12 cm. How much soup can it hold? Use 3.14 for π and round to the nearest tenth.

2. An ice cream cone has a radius of 2 in. and a height of 6 in. What is its volume? Use 3.14 for π and round to the nearest tenth.

3. A basketball has a radius of 4.5 in. What is its volume? Use 3.14 for π and round to the nearest tenth.

4. A cylinder has a volume of 314 cubic centimeters and a radius of 5 cm. What is its height? Use 3.14 for π.

5. A cylinder has a volume of 90 cubic inches. A cone has the same radius and height. What is the cone's volume?

6. A grain silo is a cylinder with a radius of 3 m and a height of 10 m, topped by a half sphere with a radius of 3 m. What is the total volume? Use 3.14 for π and round to the nearest tenth.

7. A ball with a radius of 3 in. fits exactly inside a cylinder with a radius of 3 in. and a height of 6 in. How much space in the cylinder is outside the ball? Use 3.14 for π and round to the nearest tenth.

8. Container A is a cone with a radius of 6 in. and a height of 6 in. Container B is a cylinder with a radius of 3 in. and a height of 8 in. Which holds more?

   A. It can't be told without π.

   B. They hold the same amount.

   C. Container B

   D. Container A

9. A pile of sand is shaped like a cone with a diameter of 12 ft and a height of 5 ft. What is its volume? Use 3.14 for π and round to the nearest tenth.

10. A cone and a cylinder have the same radius and the same height. Explain how their volumes are related, and describe an experiment that would show it.

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Challenge

Multi-step and word problems that stretch it.

1. A cylinder has a volume of 1,004.8 cubic inches and a radius of 4 in. What is its height? Use 3.14 for π.

2. A sphere has a volume of 113.04 cubic centimeters. What is its radius? Use 3.14 for π.

3. The radius of a cylinder is doubled and its height stays the same. The volume is multiplied by what number?

4. The radius of a sphere is doubled. The volume is multiplied by what number?

5. A cylinder has a diameter of 6 cm and a height of 5 cm. Kim writes $V = 3.14 \times 6^2 \times 5 = 565.2$. What is her error?

   A. She used the diameter as the radius; $V = 3.14 \times 3^2 \times 5 = 141.3$.

   B. She should have multiplied by $\frac{1}{3}$.

   C. There is no error.

   D. She should have cubed the radius.

6. A cone with a radius of 3 cm and a height of 9 cm is filled with water. The water is poured into an empty cylinder with a radius of 3 cm. How deep is the water in the cylinder?

7. A capsule is a cylinder with a radius of 2 mm and a height of 6 mm, with a half sphere of radius 2 mm on each end. What is its volume? Use 3.14 for π and round to the nearest tenth.

8. A cone has a volume of 37.68 cubic inches and a radius of 2 in. What is its height? Use 3.14 for π.

9. A cylinder with a radius of 5 in. and a height of 10 in. holds a solid ball with a radius of 3 in. How much water would fill the rest of the cylinder? Use 3.14 for π and round to the nearest tenth.

10. A cone has a radius of 3 cm and the same volume as a sphere with a radius of 3 cm. What is the height of the cone?