

# Volume of a Cylinder

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Score: \_\_\_\_\_ / 18

### Quick Review and Helpful Hints

A cylinder's *volume* is the area of the circular base times the height:  $V = \pi r^2 h$ . First find the base area  $\pi r^2$ , then multiply by the height  $h$ . Use  $\pi \approx 3.14$  and give the answer in cubic units.

▷ **Example:** Find the volume of a cylinder with  $r = 3$  and  $h = 5$  (use  $\pi \approx 3.14$ ). **Work:** Base area =  $\pi r^2 = 3.14(9) = 28.26$ . Multiply by the height:  $28.26 \times 5$ .  
 ★ **Answer:** 141.3

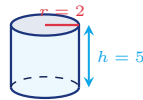


$$V = \pi r^2 h.$$

### Practice Problems

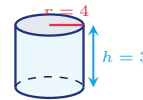
Use  $\pi \approx 3.14$ . Use each cylinder diagram to find the volume.

1. Find the volume.



\_\_\_\_\_

6. Find the volume.



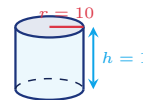
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2. Find the volume.



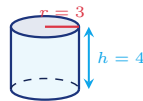
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7. Find the volume.



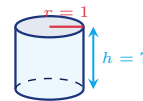
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3. Find the volume.



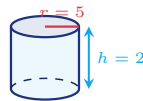
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8. Find the volume.



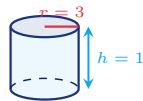
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4. Find the volume.



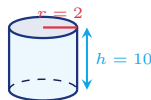
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9. Find the volume.



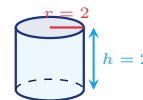
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5. Find the volume.



\_\_\_\_\_

10. Find the volume.



\_\_\_\_\_



11. Find the volume.



\_\_\_\_\_

13. Find the volume.



\_\_\_\_\_

12. Find the volume.



\_\_\_\_\_

14. Find the volume.



\_\_\_\_\_

◆ Word Problems



15. A soup can has radius 3 cm and height 10 cm. How many cubic centimeters of soup can it hold?

Use  $V = \pi r^2 h$ ,  $\pi \approx 3.14$

Work: \_\_\_\_\_

\_\_\_\_\_



17. A concrete form for a small post has radius 2 ft and height 3 ft. Find the volume needed.

Use  $V = \pi r^2 h$ ,  $\pi \approx 3.14$

Work: \_\_\_\_\_

\_\_\_\_\_



16. A rain barrel has radius 5 ft and height 4 ft. What volume of water does it hold?

Use  $V = \pi r^2 h$ ,  $\pi \approx 3.14$

Work: \_\_\_\_\_

\_\_\_\_\_



18. A candle mold has radius 4 cm and height 5 cm. How many cubic centimeters of wax does it contain?

Use  $V = \pi r^2 h$ ,  $\pi \approx 3.14$

Work: \_\_\_\_\_

\_\_\_\_\_



## Answer Keys

- |  |   |  |
|--|---|--|
| 1. <input type="text" value="62.8"/>   | 7. <input type="text" value="314"/>     | 13. <input type="text" value="37.68"/>     |
| 2. <input type="text" value="31.4"/>   | 8. <input type="text" value="21.98"/>   | 14. <input type="text" value="251.2"/>     |
| 3. <input type="text" value="113.04"/> | 9. <input type="text" value="282.6"/>   | 15. <input type="text" value="282.6 cm³"/> |
| 4. <input type="text" value="157"/>    | 10. <input type="text" value="25.12"/>  | 16. <input type="text" value="314 ft³"/>   |
| 5. <input type="text" value="125.6"/>  | 11. <input type="text" value="314"/>    | 17. <input type="text" value="37.68 ft³"/> |
| 6. <input type="text" value="150.72"/> | 12. <input type="text" value="226.08"/> | 18. <input type="text" value="251.2 cm³"/> |

### Step-by-Step Explanations

**1.** Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Volume is  $\pi r^2 h$ . Base area =  $3.14 \times 2^2 = 3.14 \times 4 = 12.56$ ; times the height 5:  $12.56 \times 5 = 62.8$ . So the final answer is 62.8.

**2.** A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Base area =  $3.14 \times 1 = 3.14$ ; times 10: 31.4. So the final answer is 31.4.

**3.** Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Base area =  $3.14 \times 9 = 28.26$ ; times 4: 113.04. So the final answer is 113.04.

**4.** Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Base area =  $3.14 \times 25 = 78.5$ ; times 2: 157. So the final answer is 157.

**5.** Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Base area =  $3.14 \times 4 = 12.56$ ; times 10: 125.6. So the final answer is 125.6.

**6.** A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Base area =  $3.14 \times 16 = 50.24$ ; times 3: 150.72. So the final answer is 150.72.

**7.** Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Base area =  $3.14 \times 100 = 314$ ; times 1: 314. So the final answer is 314.

**8.** Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Base area =  $3.14 \times 1 = 3.14$ ; times 7: 21.98. So the final answer is 21.98.

**9.** Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Base area =  $3.14 \times 9 = 28.26$ ; times 10: 282.6. So the final answer is 282.6.

**10.** A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Base area =  $3.14 \times 4 = 12.56$ ; times 2: 25.12. So the final answer is 25.12.

**11.** Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Base area =  $3.14 \times 25 = 78.5$ ; times 4: 314. So the final answer is 314.

**12.** Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Base area =  $3.14 \times 36 = 113.04$ ; times 2: 226.08. So the final answer is 226.08.

**13.** Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Base area =  $3.14 \times 4 = 12.56$ ; times 3: 37.68. So the final answer is 37.68.

**14.** A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Base area =  $3.14 \times 16 = 50.24$ ; times 5: 251.2. So the final answer is 251.2.

**15.** Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $V = \pi r^2 h = 3.14 \times 3^2 \times 10 = 3.14 \times 9 \times 10 = 282.6 \text{ cm}^3$ . So the final answer is 282.6  $\text{cm}^3$ .

**16.** Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $V = 3.14 \times 5^2 \times 4 = 3.14 \times 25 \times 4 = 314 \text{ ft}^3$ . So the final answer is 314  $\text{ft}^3$ .

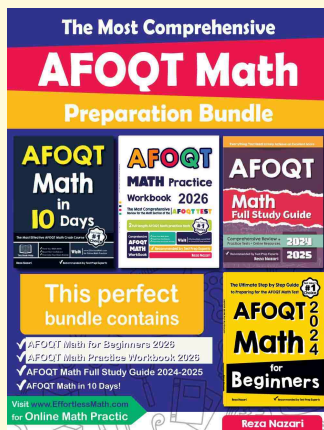
**17.** Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $V = 3.14 \times 2^2 \times 3 = 3.14 \times 4 \times 3 = 37.68 \text{ ft}^3$ . So the final answer is 37.68  $\text{ft}^3$ .

**18.** A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $V = 3.14 \times 4^2 \times 5 = 3.14 \times 16 \times 5 = 251.2 \text{ cm}^3$ . So the final answer is 251.2  $\text{cm}^3$ .



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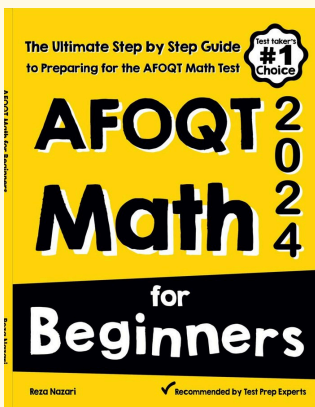
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