# Finding Volume Using Formulas

Finding Volume Using Formulas: Models and Computation

**Name** _____ **Date** _____ **Score** _____ / 6

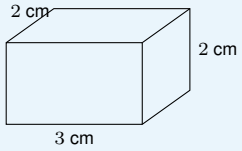
**QUICK REVIEW**

For a rectangular prism, $V = l \times w \times h = B \times h$, where $B$ is base area. A $5$ cm by $3$ cm base has $B = 15$ cm$^2$; at height $4$ cm, $V = 15 \times 4 = 60$ cm$^3$. To find height, divide volume by base area.

**Worked example**

Find the volume of a rectangular prism measuring $3$ cm by $2$ cm by $2$ cm.

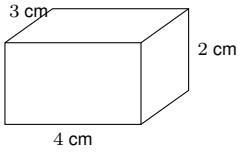
**1.** One layer or base has $3 \times 2 = 6$ square centimeters.
**2.** Volume is base area times height: $6 \times 2 = 12$ cubic centimeters.
**3.** Check the height: $12 \div 6 = 2$ cm.
**Answer:** $12$ cm$^3$.



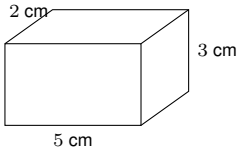

## Practice Problems

Show your thinking.

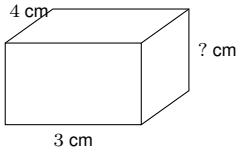
**1.** Find the volume of a rectangular prism measuring $4$ cm by $3$ cm by $2$ cm.



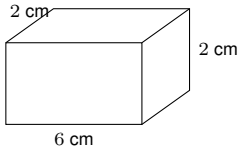

**2.** A prism has base dimensions $5$ cm and $2$ cm, and height $3$ cm. Find base area first, then volume.



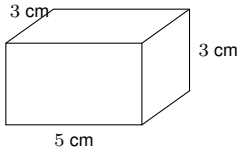

**3.** A prism has volume $48$ cm$^3$ and base $3$ cm by $4$ cm. Find its height.



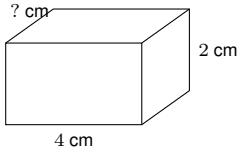

**4.** A student adds $6 + 2 + 2$ to find this prism's volume. Correct the operation and cubic unit.




**5.** Compare the volume of this $5$ cm by $3$ cm by $3$ cm prism with a volume of $46$ cm$^3$. Find the gap.




**6.** A prism has volume $32$ cm$^3$, length $4$ cm, and height $2$ cm. Find its width.



# Answer Key

1. $24$ cm$^3$.
2. $30$ cm$^3$.
3. $4$ cm.
4. $24$ cm$^3$.
5. The given prism has $1$ cm$^3$ less volume.
6. $4$ cm.

## Step-by-Step Solutions

Follow each calculation, then check your own work.

### Problem 1

1. One layer or base has $4 \times 3 = 12$ square centimeters.
2. Volume is base area times height: $12 \times 2 = 24$ cubic centimeters.
3. Check the height: $24 \div 12 = 2$ cm.

### Problem 2

1. One layer or base has $5 \times 2 = 10$ square centimeters.
2. Volume is base area times height: $10 \times 3 = 30$ cubic centimeters.
3. Check the height: $30 \div 10 = 3$ cm.

### Problem 3

1. Use the known base area $3 \times 4 = 12$ cm$^2$; missing height is $48 \div 12 = 4$ cm.
2. One layer or base has $3 \times 4 = 12$ square centimeters.
3. Volume is base area times height: $12 \times 4 = 48$ cubic centimeters.
4. Check the height: $48 \div 12 = 4$ cm.

### Problem 4

1. One layer or base has $6 \times 2 = 12$ square centimeters.
2. Volume is base area times height: $12 \times 2 = 24$ cubic centimeters.
3. Check the height: $24 \div 12 = 2$ cm.

### Problem 5

1. One layer or base has $5 \times 3 = 15$ square centimeters.
2. Volume is base area times height: $15 \times 3 = 45$ cubic centimeters.
3. Check the height: $45 \div 15 = 3$ cm.
4. $46 - 45 = 1$ cm$^3$.

### Problem 6

1. The known length-height product is $4 \times 2 = 8$ cm$^2$; width is $32 \div 8 = 4$ cm.
2. One layer or base has $4 \times 4 = 16$ square centimeters.
3. Volume is base area times height: $16 \times 2 = 32$ cubic centimeters.
4. Check the height: $32 \div 16 = 2$ cm.

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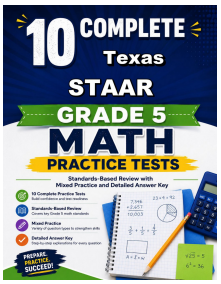


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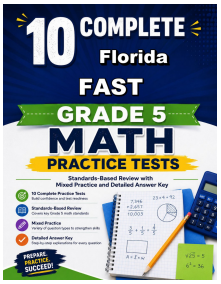


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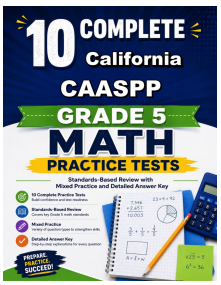


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