Volume of Prisms

Spot mistakes, reason, and work backward

Name _____ **Date** _____ **Score** _____ / 8

QUICK REVIEW

Prism volume is $V = Bh$, where B is the base area and h is the perpendicular distance between matching bases. A right triangle with legs $3, 4$ cm has $B = 6$ cm^2; prism length 5 cm gives $V = 6(5) = 30$ cm^3.

Worked example

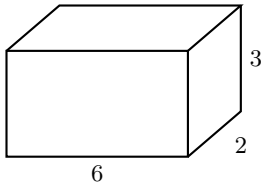
A prism base area is 12 cm^2 and height 5 cm. Find volume.

1. Use $V = Bh$ with $B = 12$, $h = 5$.
2. $V = 12(5) = 60$ cm^3.
3. Check: $60/12 = 5$ cm.
Answer: 60 cm^3.

Practice Problems

Show your thinking.

1. A student adds $6 + 2 + 3$ for the volume of a 6 by 2 by 3 cm prism. Correct the model and units.

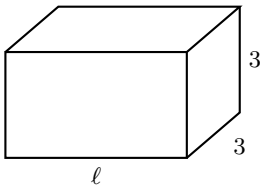


2. A prism has volume 84 cm^3 and base area 21 cm^2. Recover its perpendicular height.

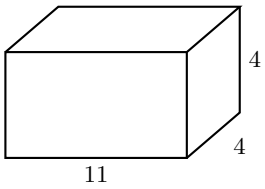
3. A student forgets the $1/2$ for a triangular prism with right-triangle legs $8, 4$ cm and length 3 cm. Correct the volume.

4. A cube has volume 125 cm^3. Recover its whole-number edge and verify by multiplication.

5. A rectangular prism has volume 90 cm^3, width 3 cm, and height 3 cm. Recover the missing length.



6. A student says raising height from 4 to 5 cm adds only 1 cm^3 to a base 11 by 4 cm prism. Find the actual increase.



7. A triangular prism has volume 60 cm^3 and length 8 cm. The base triangle has a 5 cm base. Recover the perpendicular triangle height.

8. A rectangular prism has volume 108 cm^3 and a 9 by 4 cm base. Find its height and verify.

Answer Key

1. 36 cm^3.
2. 4 cm.
3. 48 cm^3.
4. Edge 5 cm.
5. Length 10 cm.
6. Increase 44 cm^3.
7. 3 cm.
8. 3 cm.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The base area is $6(2) = 12$ cm^2.
2. There are 3 layers of 12 unit cubes, so $V = 12(3) = 36$ cm^3.
3. Adding gives $6 + 2 + 3 = 11$ cm, a length sum, not volume.

Problem 2

1. From $V = Bh$, set $21h = 84$.
2. Divide by the base area: $h = 84/21 = 4$ cm.
3. Check: $21(4) = 84$ cm^3.

Problem 3

1. Triangle area: $(8)(4)/2 = 16$ cm^2.
2. Volume: $16(3) = 48$ cm^3.
3. Without the half, $8(4)(3) = 96$ cm^3 would be a rectangular prism, twice this volume.

Problem 4

1. All dimensions equal e, so $e^3 = 125$.
2. The positive whole-number solution is 5 because $5^3 = 125$.
3. Check: $5(5)(5) = 125$ cm^3.

Problem 5

1. The end area is $3(3) = 9$ cm^2.
2. Divide volume by the end area: $\ell = 90/9 = 10$ cm.
3. Check: $9(10) = 90$ cm^3.

Problem 6

1. Shorter volume: $44(4) = 176$ cm^3.
2. Taller volume: $44(5) = 220$ cm^3.
3. The added layer gives $220 - 176 = 44$ cm^3.

Problem 7

1. Triangle area is volume divided by prism length: $60/8 = 15/2$ cm^2.
2. Use triangle height t: $(5t)/2 = 15/2$.
3. Double the area and divide by the base: $t = 2(15/2)/5 = 3$ cm.

Problem 8

1. Base area: $9(4) = 36$ cm^2.
2. Divide volume by base area: $h = 108/36 = 3$ cm.
3. Check: $36(3) = 108$ cm^3.

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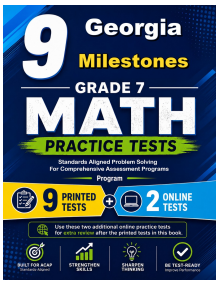

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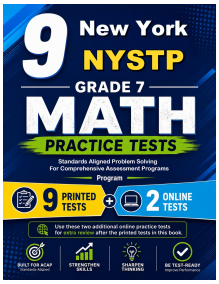

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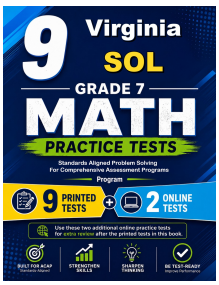

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