

Grade 6 · Volume of Rectangular Prisms · Test Answer Key

Common Core 6.G.A.2 · mathovore.fr

This answer key gives a full worked solution and a scoring guide for each of the eight questions. The test is worth 20 points. Award partial credit as described, and check that every volume has cubic units, since square units show a confusion between area and volume.

Grade 6 Common Core: 6.G.A.2

Question 1: Whole-number edges (2 points)

- a. $V = 9 \times 4 \times 6 = 216$. The volume is 216 in^3 .
- b. $V = Bh = 35 \times 4 = 140$. The volume is 140 ft^3 .

Scoring: 1 point for each part. Award the point for a correct value with cubic units; give no credit if the units are square.

Question 2: Fractional edges (2 points)

$$V = \frac{3}{4} \times \frac{1}{2} \times 4 = \frac{3}{8} \times 4 = \frac{12}{8} = \frac{3}{2} = 1\frac{1}{2}$$

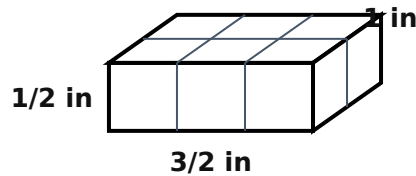
The volume is $1\frac{1}{2} \text{ ft}^3$.

Scoring: 1 point for a correct product setup; 1 point for the correct simplified volume with cubic units.

Question 3: Cube packing (3 points)

- a. Length $3 \times \frac{1}{2} = \frac{3}{2} \text{ in}$, width $2 \times \frac{1}{2} = 1 \text{ in}$, height $\frac{1}{2} \text{ in}$.
- b. There are $3 \times 2 \times 1 = 6$ cubes, each $\frac{1}{8} \text{ in}^3$. $6 \times \frac{1}{8} = \frac{3}{4}$. The volume is $\frac{3}{4} \text{ in}^3$.
- c. $\frac{3}{2} \times 1 \times \frac{1}{2} = \frac{3}{4} \text{ in}^3$, which matches.

Scoring: 1 point for each part. In part (b), award the point only if the cube volume $\frac{1}{8} \text{ in}^3$ is used.



$$6 \text{ cubes} \times \frac{1}{8} = \frac{3}{4} \text{ cubic inch}$$

Solution figure.

Question 4: Missing height (2 points)

$$84 = 7 \times 4 \times h = 28h, \text{ so } h = 84 \div 28 = 3.$$

The height is 3 ft.

Scoring: 1 point for a correct equation or base area of 28; 1 point for the correct height with units.

Question 5: Fish tank (3 points)

- a. $30 \times 12 \times 15 = 5,400 \text{ in}^3$.
- b. $30 \times 12 \times 10 = 3,600 \text{ in}^3$.
- c. $5,400 - 3,600 = 1,800 \text{ in}^3$.

Answers: $5,400 \text{ in}^3$, $3,600 \text{ in}^3$, $1,800 \text{ in}^3$.

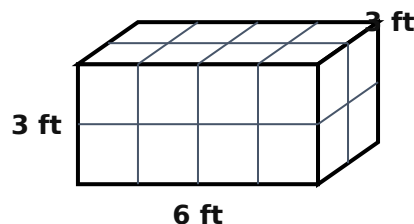
Scoring: 1 point for each part with correct cubic units.

Question 6: Packing crates (3 points)

- a. $6 \times 3 \times 3 = 54 \text{ ft}^3$.
- b. $\frac{3}{2} \times \frac{3}{2} \times \frac{3}{2} = \frac{27}{8} = 3\frac{3}{8} \text{ ft}^3$.
- c. $54 \div \frac{27}{8} = 54 \times \frac{8}{27} = 16$. Check by rows: $6 \div \frac{3}{2} = 4$, $3 \div \frac{3}{2} = 2$, $3 \div \frac{3}{2} = 2$, and $4 \times 2 \times 2 = 16$.

Answers: 54 ft^3 , $3\frac{3}{8} \text{ ft}^3$, **16 boxes**.

Scoring: 1 point for each part.



$$4 \times 2 \times 2 = 16 \text{ boxes}$$

Question 7: Compare prisms (2 points)

A: $5 \times 4 \times 3 = 60 \text{ ft}^3$. B: $6 \times \frac{5}{2} \times 5 = 15 \times 5 = 75 \text{ ft}^3$.

$75 - 60 = 15$. **Prism B** is greater by 15 ft^3 .

Scoring: 1 point for both volumes; 1 point for the comparison and difference with units.

Question 8: Sandbox sand (3 points)

a. $8 \times 5 \times \frac{3}{4} = 40 \times \frac{3}{4} = 30 \text{ ft}^3$.

b. $30 \div 1\frac{1}{2} = 30 \div \frac{3}{2} = 20 \text{ bags}$.

c. $20 \times \$7.25 = \$145$.

Answers: 30 ft^3 , **20 bags**, \$145.

Scoring: 1 point for each part.

Total
20 points