

Grade 6 - Volume of Prisms with Fractional Edges - Answer Key

Common Core 6.G.A.2 · maths-pdf.fr/en/

Check each volume here. The solutions write the formula, substitute the edge lengths, and give the final answer in cubic units in bold. Prism diagrams show unit cubes and fractional cubes for several problems.

Grade 6 · Common Core State Standards: **6.G.A.2**

Exercise 1 - Volume with unit cubes

$$V = \ell \cdot w \cdot h = 5 \cdot 3 \cdot 4 = 60$$

$$60 \text{ in}^3$$

Exercise 2 - Volume of a cube

$$V = 3 \cdot 3 \cdot 3 = 27$$

$$27 \text{ in}^3$$

Exercise 3 - One fractional edge

$$V = \frac{3}{2} \cdot 2 \cdot 4 = 3 \cdot 4 = 12$$

$$12 \text{ ft}^3$$

Exercise 4 - Packing with half-unit cubes

$$\text{Cubes: } 4 \cdot 3 \cdot 2 = 24.$$

$$\text{One cube: } \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{8}.$$

$$24 \cdot \frac{1}{8} = 3. \text{ Check: } 2 \cdot \frac{3}{2} \cdot 1 = 3.$$

$$3 \text{ units}^3$$

Exercise 5 - Volume with all fractions

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

$$1\frac{1}{2} \text{ m}^3$$

Exercise 6 - Base times height

$$V = 12 \cdot 5 = 60$$

$$60 \text{ ft}^3$$

Exercise 7 - Fractional base area

$$V = \frac{3}{4} \cdot 8 = 6$$

$$6 \text{ m}^3$$

Exercise 8 - Find the missing height

$$36 = 4 \cdot 3 \cdot h = 12h.$$

$$h = 36 \div 12 = 3$$

3 centimeters

Exercise 9 - Find the missing length

$$45 = \ell \cdot 3 \cdot 5 = 15\ell.$$

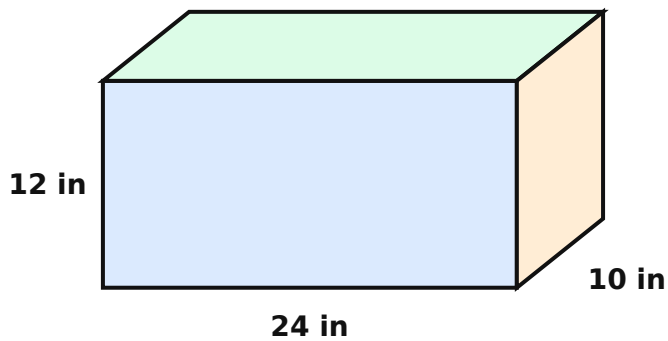
$$\ell = 45 \div 15 = 3$$

3 inches

Exercise 10 - Fish tank

$$V = 24 \cdot 10 \cdot 12 = 2880$$

$$2,880 \text{ in}^3$$



A tank with volume 2,880 cubic inches.

Exercise 11 - Mixed number edges

$$V = \frac{5}{2} \cdot 3 \cdot \frac{3}{2} = \frac{45}{4} = 11\frac{1}{4}$$

$$11\frac{1}{4} \text{ ft}^3$$

Exercise 12 - Partly filled tank

$$\text{Full tank: } \frac{3}{2} \cdot 2 \cdot \frac{3}{2} = \frac{9}{2}$$

$$\text{Water: } \frac{3}{4} \cdot \frac{9}{2} = \frac{27}{8} = 3\frac{3}{8}$$

$$3\frac{3}{8} \text{ ft}^3$$

Amount	Volume
Full tank	4 1/2 ft ³
3/4 full	3 3/8 ft ³

Three fourths of the full tank.

Exercise 13 - Same volume

$$\text{A: } 4 \cdot 3 \cdot 2 = 24. \text{ B: } 2 \cdot 2 \cdot 6 = 24.$$

Both have a volume of 24 cubic feet (equal).

Exercise 14 - Boxes in a crate

Crate: $4 \cdot 2 \cdot 3 = 24$ cubic feet.

Box: $1 \cdot \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$ cubic foot.

$$24 \div \frac{1}{4} = 96$$

96 boxes

Exercise 15 - Sandbox

$V = 6 \cdot 4 \cdot \frac{1}{2} = 12$ cubic feet.

Cost: $\$5.00 \cdot 12 = \$60.00$.

12 ft^3 ; **\$60.00**

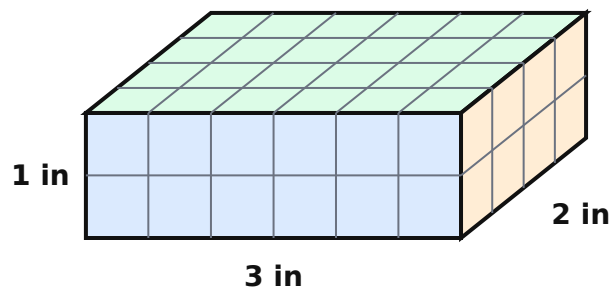
Exercise 16 - Cubes of half a unit

Box: $3 \cdot 2 \cdot 1 = 6$. Cube: $\frac{1}{8}$.

$$6 \div \frac{1}{8} = 48.$$

Check by counting: 6 cubes along the length, 4 along the width, and 2 along the height give $6 \cdot 4 \cdot 2 = 48$.

48 cubes



Each cube has an edge of $\frac{1}{2}$ inch.

Exercise 17 - Butter block

$$\frac{7}{2} \cdot \frac{3}{2} \cdot \frac{3}{2} = \frac{63}{8} = 7\frac{7}{8}$$

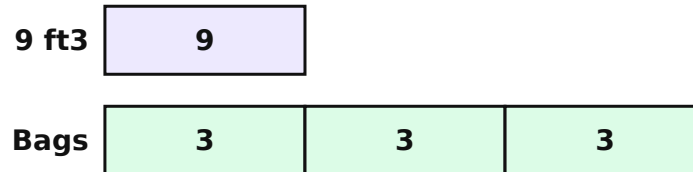
$$7\frac{7}{8} \text{ in}^3$$

Exercise 18 - Planter box

Volume: $3 \cdot \frac{3}{2} \cdot 2 = 9$ cubic feet.

$$9 \div 3 = 3$$

3 bags



Three bags of 3 cubic feet fill the box.

Exercise 19 - Three fractions

$$V = \frac{3}{4} \cdot \frac{2}{3} \cdot \frac{1}{2} = \frac{6}{24} = \frac{1}{4}$$

$$\frac{1}{4} \text{ in}^3$$

Exercise 20 - Multi-step volume

Bottom: $4 \cdot 3 \cdot \frac{3}{2} = 18$. Top: $4 \cdot 3 \cdot 2 = 24$.

Total volume $18 + 24 = 42$. Total height $1\frac{1}{2} + 2 = 3\frac{1}{2}$. Check: $4 \cdot 3 \cdot 3.5 = 42$.

$$42 \text{ ft}^3; 3\frac{1}{2} \text{ ft}$$