

25. Volume Calculation

Derivation: Volume Formula for a Rectangular Prism

A rectangular prism with **length a**, **width b**, **height c**

Can be divided into $a \times b \times c$ unit cubes

By additivity of volume: $V = a \times b \times c$

a)

Length 5 cm, width 3 cm, height 4 cm

$$V = 5 \times 3 \times 4 = 60 \text{ cm}^3$$

Length 6 cm, width 2 cm, height 5 cm

$$V = 6 \times 2 \times 5 = 60 \text{ cm}^3$$

Base area $B = 12 \text{ cm}^2$, height $h = 3 \text{ cm}$

$$V = B \times h = 12 \times 3 = 36 \text{ cm}^3$$

Base area $B = 8 \text{ cm}^2$, height $h = 6 \text{ cm}$

$$V = B \times h = 8 \times 6 = 48 \text{ cm}^3$$

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b)

Length 4 cm, width 4 cm, height 3 cm. What is the volume?

$$4 \times 4 \times 3 = \boxed{} \text{ cm}^3$$

c)

Length 7 cm, width 2 cm, height 5 cm. What is the volume?

$$7 \times 2 \times 5 = \boxed{} \text{ cm}^3$$

d)

Base B = 15 cm², height h = 4 cm. What is the volume?

$$15 \times 4 = \boxed{} \text{ cm}^3$$

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e)

Length 9 cm, width 3 cm, height 2 cm. What is the volume?

$$9 \times 3 \times 2 = \boxed{} \text{ cm}^3$$

f)

Base B = 20 cm², height h = 5 cm. What is the volume?

$$20 \times 5 = \boxed{} \text{ cm}^3$$