Similar Solids & Volume Scale Factors Worksheet

Linear, Area & Volume Scale Factors

Reference: Edexcel IGCSE June 2025 / Paper 2H / Q26

I Do

A and **B** are two similar solids.
The height of solid **A** is 31 cm.
The height of solid **B** is 18.6 cm.

Given that

$$\text{volume of solid } \mathbf{A} - \text{volume of solid } \mathbf{B} = 735 \text{ cm}^3$$

find the volume of solid **A**.

(Total for Question 1 is 5 marks)

We Do

C and **D** are two similar solids.
The height of solid **C** is 25 cm.
The height of solid **D** is 15 cm.

Given that

$$\text{volume of solid } \mathbf{C} - \text{volume of solid } \mathbf{D} = 392 \text{ cm}^3$$

find the volume of solid **C**.

(Total for Question 2 is 5 marks)

You Do

P and **Q** are two similar solids.
The height of solid **P** is 20 cm.
The height of solid **Q** is 12 cm.

Given that

$$\text{volume of solid } \mathbf{P} - \text{volume of solid } \mathbf{Q} = 392 \text{ cm}^3$$

find the volume of solid **P**.

(Total for Question 3 is 5 marks)

Challenge

X and **Y** are two similar solids.
The total surface area of solid **X** is 180 cm^2.
The total surface area of solid **Y** is 80 cm^2.

Given that the volume of solid **X** is 1080 cm^3, find the volume of solid **Y**.

(Total for Question 4 is 5 marks)

Answers & Worked Solutions

• **I Do:**

1. Linear scale factor $k = \frac{18.6}{31} = 0.6 = \frac{3}{5}$

2. Volume scale factor $k^3 = 0.6^3 = 0.216$

3. Volume $B = 0.216 \times$ ***Volume*** A

4. Volume $A - 0.216$ ***Volume*** $A = 735 \implies 0.784$ ***Volume*** $A = 735$

5. Volume $A = \frac{735}{0.784} = 937.5$ cm^3

Answer: 937.5 cm^3

• **We Do:**

1. Linear scale factor $k = \frac{15}{25} = 0.6$

2. Volume scale factor $k^3 = 0.6^3 = 0.216$

3. Volume $D = 0.216 \times$ ***Volume*** C

4. Volume $C - 0.216$ ***Volume*** $C = 392 \implies 0.784$ ***Volume*** $C = 392$

5. Volume $C = \frac{392}{0.784} = 500$ cm^3

Answer: 500 cm^3

• **You Do:**

1. Linear scale factor $k = \frac{12}{20} = 0.6$

2. Volume scale factor $k^3 = 0.6^3 = 0.216$

3. Volume $Q = 0.216 \times$ ***Volume*** P

4. 0.784 ***Volume*** $P = 392 \implies$ ***Volume*** $P = 500$ cm^3

Answer: 500 cm^3

• **Challenge:**

1. Area scale factor $k^2 = \frac{80}{180} = \frac{4}{9}$

2. Linear scale factor $k = \sqrt{\frac{4}{9}} = \frac{2}{3}$

3. Volume scale factor $k^3 = \left(\frac{2}{3}\right)^3 = \frac{8}{27}$

4. Volume $Y = 1080 \times \frac{8}{27} = 320$ cm^3

Answer: 320 cm^3