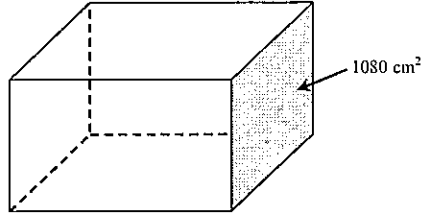
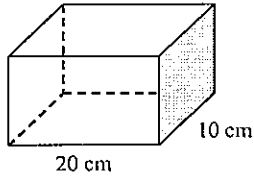


- 1 The rectangular prisms below are similar. The dimensions of the base of the smaller prism are 20 cm by 10 cm. Its volume is  $2400 \text{ cm}^3$ . The area of the shaded face of the larger prism is  $1080 \text{ cm}^2$ .

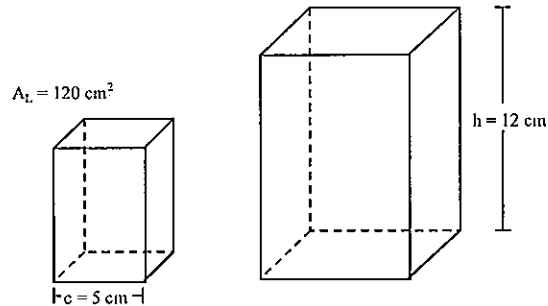


What is the volume of the larger prism?

Show all your work.

Answer: The volume of the larger prism is \_\_\_\_\_  $\text{cm}^3$ .

- 2 The two right prisms with square bases represented below are similar.



The lateral area of the smaller prism is  $120 \text{ cm}^2$  and one side of its base measures 5 cm. If the height of the larger prism is 12 cm, what is its volume?

Show all your work.

Answer: The volume of the larger prism is \_\_\_\_\_  $\text{cm}^3$ .

Ann Serkey

| 1- Contents |      |           |                 |                 |
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| Question    | Item | Objective | Type            | Skill           |
| 1           | 2125 | GEO.01    | Extended answer | Problem solving |
| 2           | 0019 | GEO.01    | Extended answer | Problem solving |
| 3           | 0364 | GEO.01    | Extended answer | Problem solving |
| 4           | 0490 | GEO.02    | Extended answer | Problem solving |
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| 10          | 2043 | ALG.02.07 | Extended answer | Problem solving |

2- Correction key

1 Example of an appropriate solution  
Height of small prism

$$\frac{2400}{20 \times 10} = 12 \text{ cm}$$

Area of face of small prism corresponding to shaded face of large prism  
 $10 \times 12 = 120 \text{ cm}^2$

Ratio of areas

$$\frac{1080 \text{ cm}^2}{120 \text{ cm}^2} = \frac{9}{1}$$

$$= k^2$$

$$k^2 = 9$$

$$k = 3$$

$$k^3 = 27$$

$$V_{\text{small}} = 2400$$

$$V_{\text{small}} \times 27 = V_{\text{large}}$$

$$2400 \times 27 = 64\,800 \text{ cm}^3$$

or

if  $k = 3$ , dimensions of large prism are

$$20 \times 3 = 60$$

$$10 \times 3 = 30$$

$$12 \times 3 = 36$$

Volume of large prism

$$60 \times 30 \times 36 = 64\,800 \text{ cm}^3$$

Answer: The volume of the larger prism is  $64\,800 \text{ cm}^3$ .

Note: Students who have found the ratios of the areas have shown that they have a partial understanding of the problem.

2 Example of an appropriate method  
Measure of the height of small prism

$$A_L = 4c \times h$$

$$120 = 4 \times 5 \times h$$

$$h = 6$$

Volume of small prism ( $V_s$ )

$$V_s = A_h \times h$$

$$V_s = 5 \times 5 \times 6$$

$$V_s = 150$$

Volume of large prism ( $V_l$ )

$$\left(\frac{6}{12}\right)^3 = \frac{150}{V^l}$$

$$\left(\frac{1}{2}\right)^3 = \frac{150}{V^l}$$

$$V_l = 1200$$

Answer The volume of the larger prism is  $1200 \text{ cm}^3$ .