

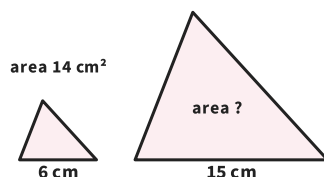
Area and Volume Scale Factors *stretch*

ANSWERS 

1



The two triangles are similar.
Find the area of the larger triangle.



$$\text{length scale factor} = 15 \div 6 = 2.5$$

$$14 \times 2.5^2$$

$$87.5 \text{ cm}^2$$

Answer

2



Two similar solids have volumes of 54 cm^3 and 250 cm^3 . The smaller one has a surface area of 45 cm^2 . Find the surface area of the larger one.

$$\text{volume scale factor} = \frac{250}{54} = \frac{125}{27}$$

$$\text{length } \frac{5}{3}, \text{ area } \frac{25}{9}: 45 \times \frac{25}{9}$$

$$125 \text{ cm}^2$$

Answer

3



A model car is made to a scale of $1 : 18$. A door of the real car has an area of 1.62 m^2 . Find the area of the model's door in cm^2 .

$$1.62 \text{ m}^2 = 16\,200 \text{ cm}^2$$

$$16\,200 \div 18^2 = 16\,200 \div 324$$

$$50 \text{ cm}^2$$

Answer

4



Two similar bottles hold 500 ml and 1.5 litres. The smaller bottle is 18 cm tall. Find the height of the larger bottle, to 3 significant figures.

$$\text{volume scale factor} = 1500 \div 500 = 3$$

$$\text{length scale factor} = \sqrt[3]{3}, 18 \times \sqrt[3]{3}$$

$$26.0 \text{ cm}$$

Answer

5



Two prisms are similar. Every length on the larger prism is 3 times the matching length on the smaller one. The smaller prism has a volume of 40 cm^3 . Fin says the larger one has a volume of 120 cm^3 . Explain his mistake and find the correct volume.

$$\text{volume scale factor is } 3^3 = 27, \text{ not } 3$$

$$40 \times 27$$

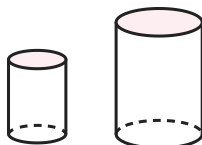
$$1080 \text{ cm}^3$$

Answer

6



The surface areas of two similar cylinders are in the ratio $4 : 9$. The smaller one has a volume of 160 cm^3 . Find the volume of the larger one.



$$\text{length scale factor} = \sqrt{\frac{9}{4}} = \frac{3}{2}$$

$$160 \times \frac{27}{8}$$

$$540 \text{ cm}^3$$

Answer

7



Two rugs are similar. The smaller rug is 1.2 m long and uses 0.9 kg of wool. The larger rug is 1.8 m long. How much wool does it use, to 2 decimal places?

$$\text{length scale factor} = 1.8 \div 1.2 = 1.5$$

$$\text{wool covers an area: } 0.9 \times 1.5^2$$

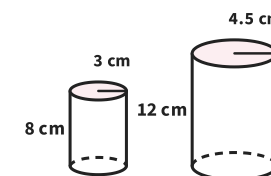
$$2.03 \text{ kg}$$

Answer

8



Are these two cylinders similar? Explain, then give the ratio of their volumes in its simplest form.



$$4.5 \div 3 = 1.5 \text{ and } 12 \div 8 = 1.5$$

$$1^3 : 1.5^3 = 8 : 27$$

$$\text{yes, } 8 : 27$$

Answer