

## E Michaelmas Similar Areas & Volumes

Remember: If (between two similar shapes) a length is  $a$  and the equivalent length is  $b$  then the length scale factor  $k$  is given by  $k = \frac{b}{a}$ . Going from the first to the second:  
lengths get multiplied by  $k$ ,  
areas get multiplied by  $k^2$ ,  
volumes get multiplied by  $k^3$ .

- Two boxes of cereal are similar in shape. The smaller one has a height of 15 cm. The larger one has a height of 20 cm.
  - Find the length scale factor  $k$  going from the smaller to the larger. 4/3
  - If the small box has volume  $750 \text{ cm}^3$ , find the volume of the larger box. 1777.7
  - If the label on the front of the smaller box has area  $20 \text{ cm}^2$ , find the area of the label on the larger box. 35.5
- Two children's toys are similar in shape. The smaller one has a height of 20 cm. The larger one has a height of 25 cm.
  - Find the length scale factor  $k$  going from the smaller to the larger. 5/4
  - If the small toy has surface area  $800 \text{ cm}^2$ , find the surface area of the larger toy. 1250
  - If the volume of the larger toy is  $250 \text{ cm}^3$ , find the volume of the smaller toy. 128
- Two cones are similar in shape. The height of the larger one is 10 cm. The height of the smaller one is 7 cm.
  - Find the length scale factor  $k$  going from the larger to the smaller. 0.7
  - If the larger cone has volume  $100 \text{ cm}^3$ , find the volume of the smaller cone. 34.3
- Two flasks are similar in shape. The surface area of the larger one is  $100 \text{ cm}^2$ . The surface area of the smaller one is  $64 \text{ cm}^2$ .
  - Find the length scale factor  $k$  going from the larger to the smaller. 0.8
  - If the volume of the larger one is  $94 \text{ cm}^3$  find the volume of the smaller one. 48.128
- Charlie has two similar sized rocks. The smaller has a volume of  $2 \text{ cm}^3$ . The larger has a volume of  $2.662 \text{ cm}^3$ .
  - If the larger one has length 1.4 cm, find the length of the smaller one. 14/11
  - If the smaller has a surface area of  $4.2 \text{ cm}^2$ , find the surface area of the larger one. 5.082
- Tiffany is similar in shape to her daughter Candy. Tiffany's back has surface area  $1500 \text{ cm}^2$ . Candy's is  $1215 \text{ cm}^2$ .
  - If Candy is 130 cm tall, how tall is Tiffany? 144.4
  - If Tiffany has a volume of  $50000 \text{ cm}^3$ , what is Candy's volume? 36450