

### Similar shapes - areas and volumes

1) Ann has two similar dolls on her shelf. The smaller one is 12cm high, and has a surface area of  $240\text{cm}^2$  and a volume of  $300\text{cm}^3$ . The larger one is 18cm high.

- (a) Find the surface area of the larger doll.
- (b) Find the volume of the larger doll.

2) A model car 24cm long has a volume of  $375\text{cm}^3$ . What is the length of a similar model car with a volume of  $81\text{cm}^3$

3) A triangle has an area of  $32\text{cm}^2$ . The length of its base is 10cm. What is a length of the base of a similar triangle with an area of  $18\text{cm}^2$ ?

4) A vase has a surface area of  $120\text{cm}^2$  and a volume of  $160\text{cm}^3$ . What is the surface area of a similar vase with a volume of  $540\text{cm}^3$ ?

5) Alan has a model aeroplane which is an exact replica of a A300 Airbus on a scale of 1:50.

- (a) The length of the model is 63cm. What is the length of a real Airbus (in metres)?
- (b)  $2400\text{cm}^3$  of metal was used in making the model, which is solid. What is the volume of an Airbus (in  $\text{m}^3$ )?
- (c) To give the whole surface of an Airbus one coat of paint requires 1200 litres of paint. How much of the same paint would be needed to paint the model?

- 6) (a) On a 1:25000 map, the distance from Oxford High School to Carfax is 9.5cm. What is this distance on the ground (in km)?
- (b) On the same map the area of the University Parks is  $3.5\text{cm}^2$ . What is their actual area?

7) A solid wooden cone 4m high has been truncated (ie the top has been cut off), leaving the figure shown, which is 3m high.



- (a) What fraction of the wood is left?
- (b) It would cost £2.40 to paint the curved surface area of the whole cone. How much would it cost to paint the curved surface area of the remaining shape?
- (c) The radius of the base of the shape is 60cm. What is the radius of the top?

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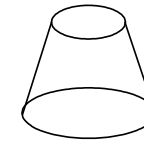
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