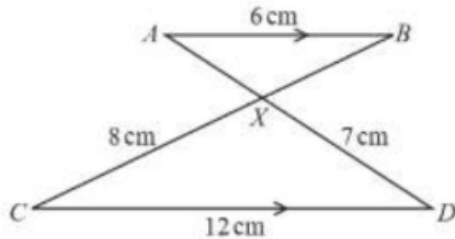




1. In the diagram, AB is parallel to CD.



AD and BC intersect at X.

AB = 6 cm, CD = 12 cm, CX = 8 cm and DX = 7 cm.

(a) Complete the statement. Triangle ABX is to triangle DCX. [1]

(b) Work out the length of BX. [2]

(c) The area of triangle DCX is 26.906cm^2 .

Use this value to find the area of

(i) triangle ABX, [2]

(ii) triangle ACX. [1]

0580/23/M/J/21 Q15)

2. The toy boat is mathematically similar to a real boat.

The length of the real boat is 32 times the length of the toy boat.

The fuel tank in the toy boat holds 0.02 litres of diesel.

Calculate how many litres of diesel the fuel tank of the real boat holds. [2]

0580/41/O/N/10 Q6(a) (iv)

3. Two cups are mathematically similar.

The larger cup has capacity 0.5 litres and height 8 cm.

The smaller cup has capacity 0.25 litres.

Find the height of the smaller cup. [3]

0580/21/O/N/16 Q16)



4. Two barrels are mathematically similar.
The smaller barrel has a height of h cm and a capacity of 100 litres.
The larger barrel has a height of 90cm and a capacity of 160 litres.
Work out the value of h [3]
0580/21/M/J/17 Q11)

5. A car, 4.4 metres long, has a fuel tank which holds 65 litres of fuel when full.
The fuel tank of a mathematically similar model of the car holds 0.05 litres of fuel when full.
Calculate the length of the model car in centimetres. [3]
0580/22/M/J/13 Q9)

6. Two cylindrical cans are mathematically similar.
The larger can has a capacity of 1 litre and the smaller can has a capacity of 440 ml.
Calculate the diameter, d , of the 440 ml can if the diameter of 1 litre can is 12 cm.
0580/22/O/N/14 Q9)

7. A company sells cereals in boxes which measure 10 cm by 25 cm by 35 cm.
They make a special edition box which is mathematically similar to the original box.
The volume of the special edition box is $15\,120\text{cm}^3$.
Work out the dimensions of this box. [3]
0580/22/O/N/12 Q12)



8. Two bottles and their labels are mathematically similar.

The smaller bottle contains 0.512 litres of water and has a label with area 96cm^2 .

The larger bottle contains 1 litre of water.

Calculate the area of the larger label. [3]

0580/23/M/J/17 Q13)

9. Two containers are mathematically similar.

The surface area of the larger container is 226cm^2 and the surface area of the smaller container is 94cm^2 .

The volume of the larger container is 680cm^3 .

Find the volume of the smaller container.

0580/43/O/N/18 Q8)(c)

10. Two mathematically similar solids have volumes of 180cm^3 and 360cm^3 .

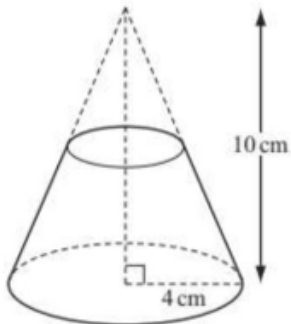
The surface area of the smaller solid is 180cm^2 .

Calculate the surface area of the larger solid.

0580/41/O/N/16 Q3(c)



11. A **solid** cone has base radius 4cm and height 10cm.
A mathematically similar cone is removed from the top as shown in the diagram.

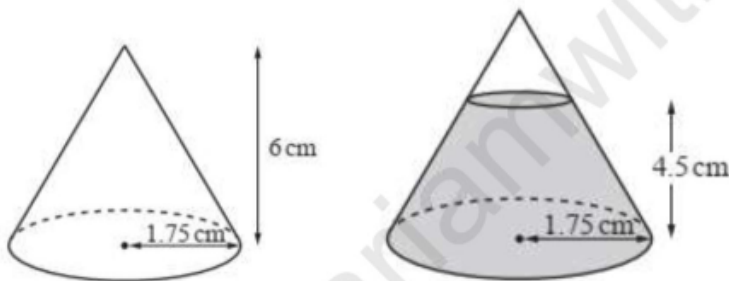


The volume of the cone that is removed is $\frac{1}{8}$ of the volume of the original cone.

- (a) Explain why the cone that is removed has radius 2cm and height 5cm. [2]
(b) Calculate the volume of the remaining solid. [4]

0580/21/M/J/14 Q18)

12. The diagram shows a cone with radius 1.75cm and height 6 cm.



The cone contains salt to a depth of 4.5cm.
The top layer of the salt forms a circle that is parallel to the base of the cone.

- (a) Show that the volume of the salt inside the cone is 18.9cm^3 , correct to 1 decimal place.[4]
(b) The salt is removed from the cone at a constant rate of 200mm^3 per second.
Calculate the time taken for the cone to be completely emptied.

Give your answer in seconds, correct to the nearest second [3]

0580/43/M/J/19 Q4) (b)(ii)

Answers

1) (a) Similar (b) 4 (c)(i) 6.73 (ii) (c)(ii) 13.5
2) 655 to 655.4
3) 6.35
4) 76.9
5) 40.3
6) 9.13
7) 12 by 30 by 42
8) 150
9) 182
10) 286
11) (b)147
12) (a) 18.94 (b) 95