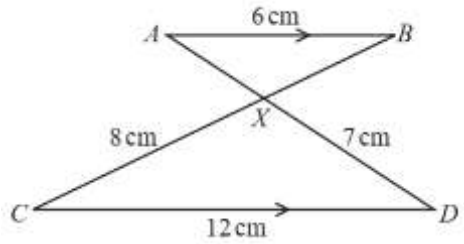
Past Papers Worksheet P4 Similarity (Area and Volume) IGCSE Mathematics 0580

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)

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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 120cm^3.
   Work out the dimensions of this box. [3]
   0580/22/O/N/12 Q12)

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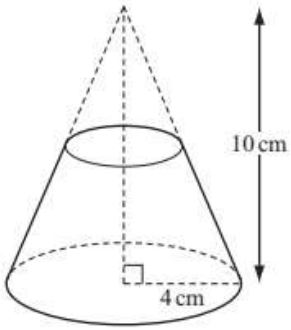
8. Two bottles and their labels are mathematically similar.
   The smaller bottle contains 0.512 litres of water and
   has a label with area $96cm^2$.
   The larger bottle contains 1 litre of water.
   Calculate the area of the larger label. [3]
   0580/23/M/J/17 Q13)

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)

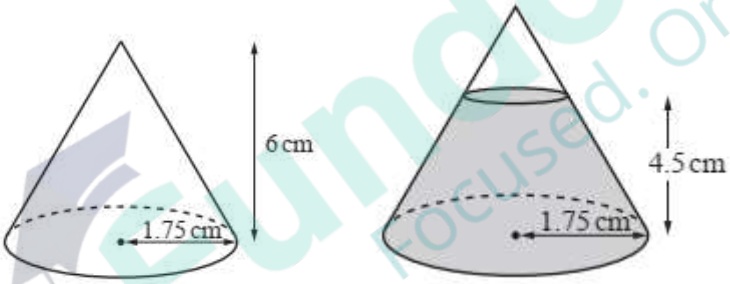
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11. A **solid** cone has base radius 4cm and height 10cm.
A mathematically similar cone is removed from the top as shown in the diagram.



The volume of the cone that is removed is 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)

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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

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