

Firrhill High School
Mathematics Department

Level 5

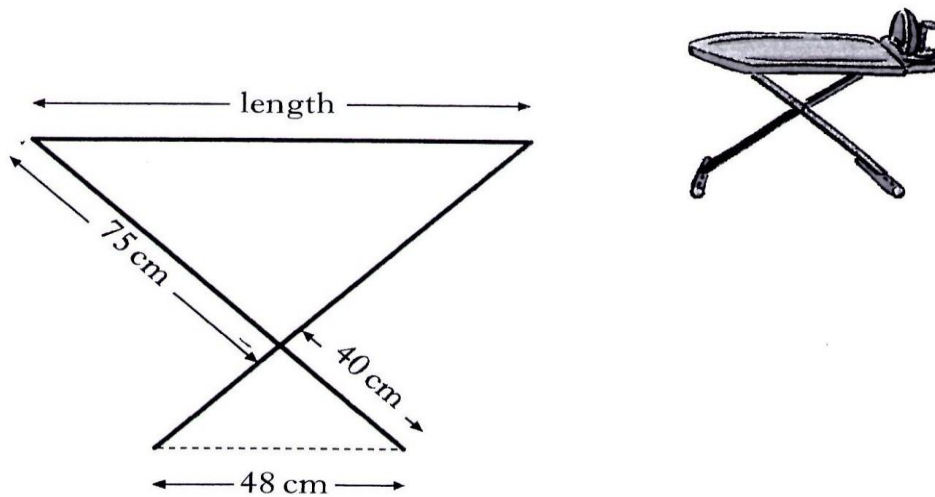
Assessment Questions

Similar Shapes

3. 2007 Paper 1 Q.8

Mick needs an ironing board.

He sees one in a catalogue with measurements as shown in the diagram below.



When the ironing board is set up, two similar triangles are formed.

Mick wants an ironing board which is at least 80 centimetres in length.

Does this ironing board meet Mick's requirements?

Show all your working.

KU	RE
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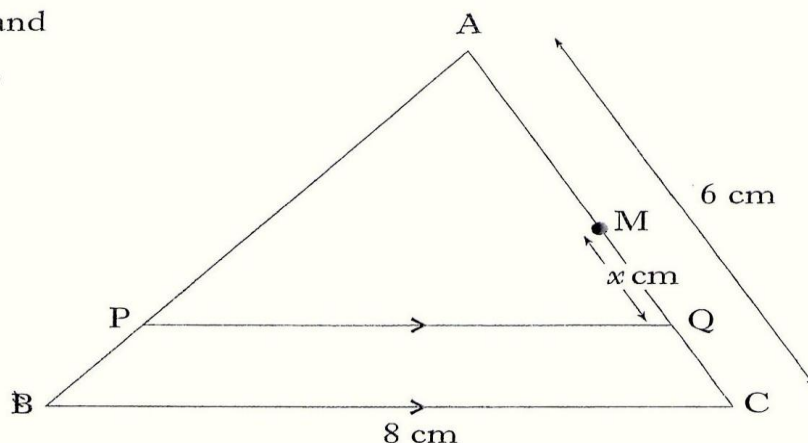
4. 2006 Paper 2 Q.11

In triangle ABC,

BC = 8 centimetres,

AC = 6 centimetres and

PQ is parallel to BC.



M is the midpoint of AC.

Q lies on AC, x centimetres from M, as shown on the diagram.

(a) Write down an expression for the length of AQ.

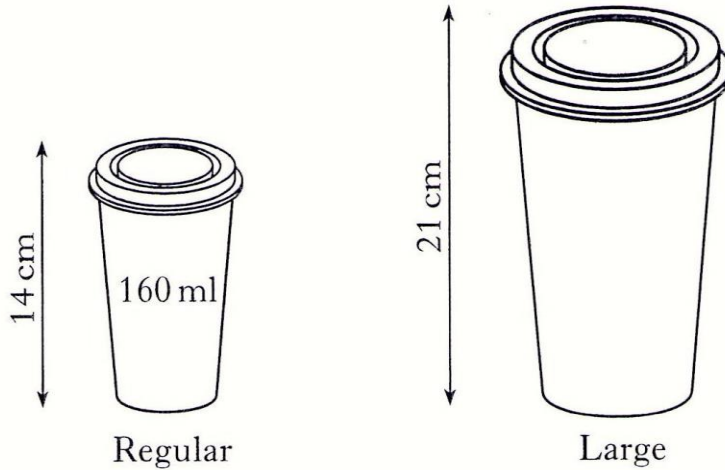
(b) Show that $PQ = (4 + \frac{4}{3}x)$ centimetres.

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5. 2006 Paper 1 Q.7

Coffee is sold in regular cups and large cups.

The two cups are mathematically similar in shape.



The regular cup is 14 centimetres high and holds 160 millilitres.

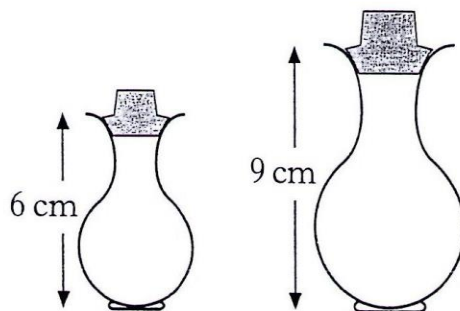
The large cup is 21 centimetres high.

Calculate how many millilitres the large cup holds.

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6. 2003 Paper 2 Q.9

Two perfume bottles are mathematically similar in shape.



The smaller one is 6 centimetres high and holds 30 millilitres of perfume.

The larger one is 9 centimetres high.

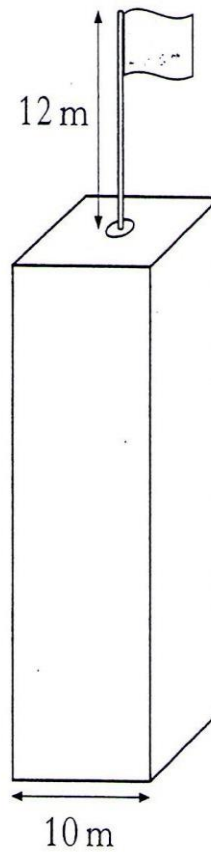
What volume of perfume will the larger one hold?

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7. 2005 paper 2 Q.5

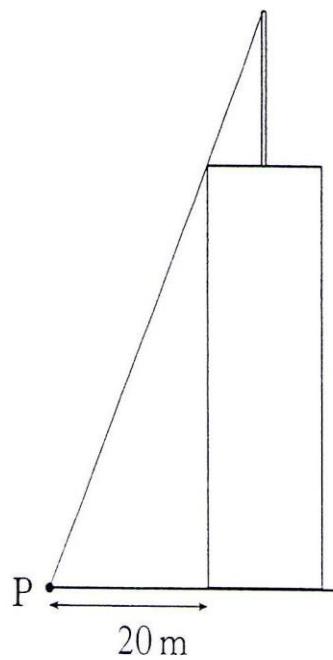
A vertical flagpole 12 metres high stands at the centre of the roof of a tower.

The tower is cuboid shaped with a square base of side 10 metres.



At a point P on the ground, 20 metres from the base of the tower, the top of the flagpole is just visible, as shown.

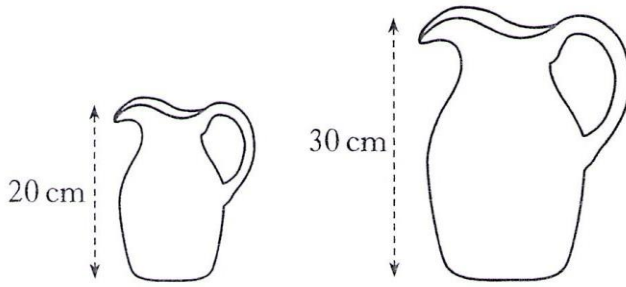
Calculate the height of the tower.



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8. 1999 Paper 2 Q.8

The diagram below shows two jugs which are mathematically similar.



The volume of the smaller jug is 0.8 litre.

Find the volume of the larger jug.

3

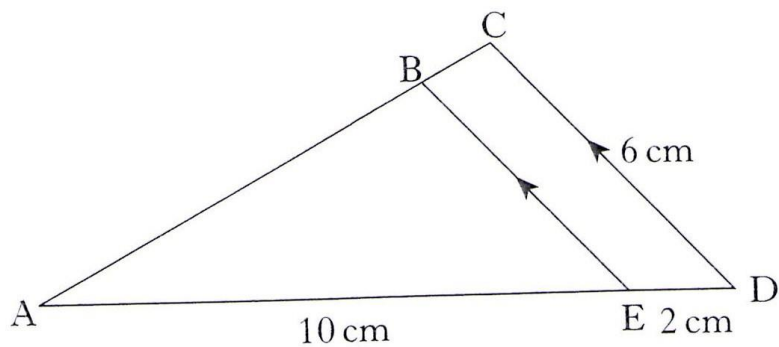
9. 1998 Paper 1 Q.5

Triangles ABE and ACD, with some of their measurements, are shown opposite.

Triangle ABE is similar to triangle ACD.

Calculate the length of BE.

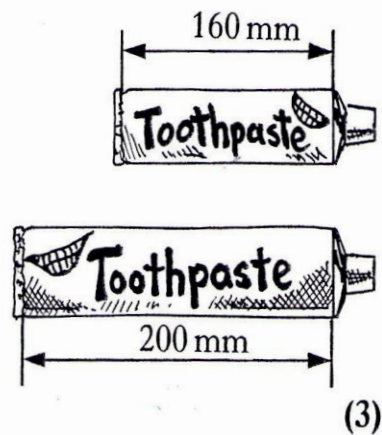
Do not use a scale drawing.



11. 1990 paper 1 (KU - you may use a calculator)

The diagram opposite shows two tubes of toothpaste.

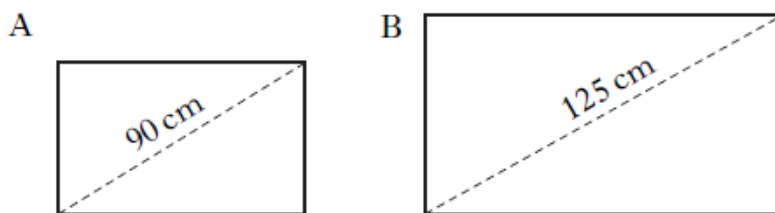
Assuming that the tubes are mathematically similar and that the price of toothpaste depends only on the volume of toothpaste in the tube, what would be the cost of the large tube when the small one costs £1.12?



12. 2011 Credit Paper 2 Q6

Two rectangular solar panels, A and B, are mathematically similar.

Panel A has a diagonal of 90 centimetres and an area of 4020 square centimetres.



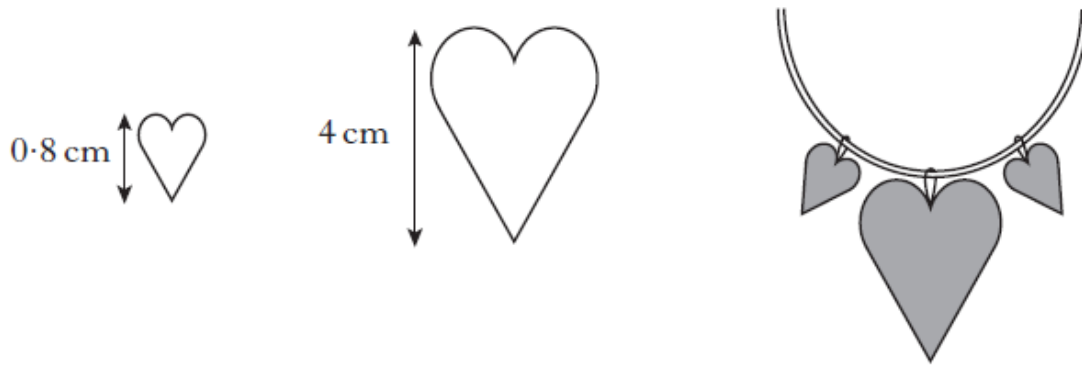
A salesman claims that panel B, with a diagonal of 125 centimetres, will be double the area of panel A.

Is this claim justified?

Show all your working.

13. 2012 Credit Paper 2 Q8

A necklace is made of beads which are mathematically similar.



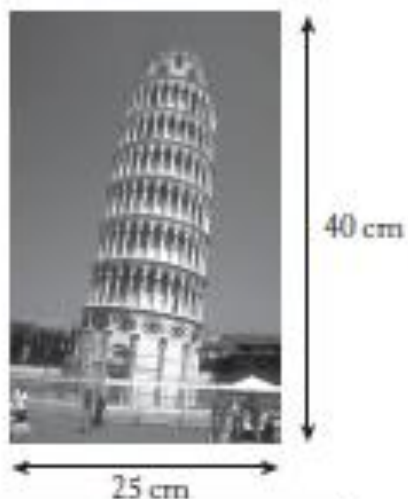
The height of the smaller bead is 0.8 centimetres and its area is 0.6 square centimetres.

The height of the larger bead is 4 centimetres.

Find the area of the larger bead.

14. 2013 Credit Paper 2 Q13

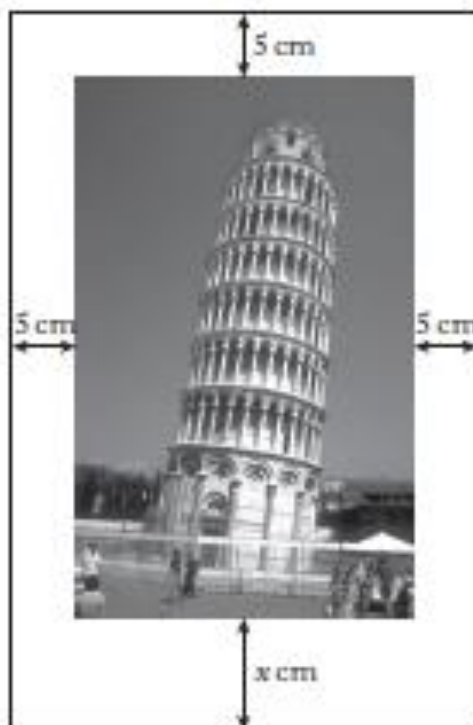
Asim has a poster which is 25 centimetres wide and 40 centimetres high.



He decides to place it on a white card.
The card and the poster are mathematically similar.



The border is 5 centimetres wide on three sides and x centimetres wide on the fourth side as shown.

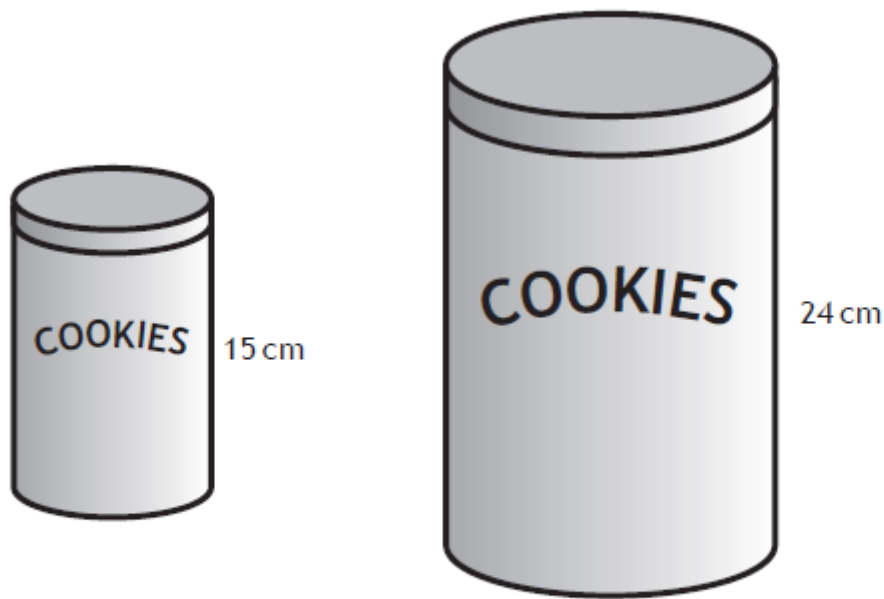


Calculate the value of x .

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15. 2014 N5 Paper 2 Q5

A supermarket sells cylindrical cookie jars which are mathematically similar.



The smaller jar has a height of 15 centimetres and a volume of 750 cubic centimetres.

The larger jar has a height of 24 centimetres.

Calculate the volume of the larger jar.

3

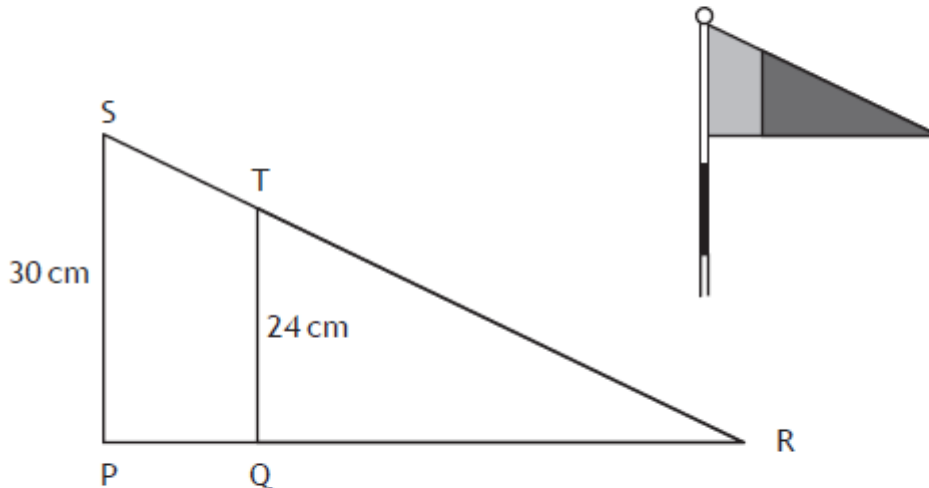
16. 2015 N5 Paper 2 Q9

The flag at each hole on a golf course is coloured red and blue.

The diagram below represents a flag.

Triangle QRT represents the red section.

PQTS represents the blue section.



Triangles PRS and QRT are mathematically similar.

The area of triangle QRT is 400 square centimetres.

Calculate the area of PQTS, the blue section of the flag.

4

Answers

1. Height = 24cm
2. Area = 112.5cm²
3. The ironing board does meet requirements as it is 10cm longer than 80cm.
4. (a) $AQ = (3 + x)$ (b) Proof, starts $LSF = \frac{(3 + x)}{6}$
5. Volume = 540ml
6. Volume = 101.25ml
7. Height = 48m
8. Volume = 2.7 litres
9. BE = 5cm
10. Height = 3m
11. Large tube = £2.19 (nearest penny)
12. No as $7754.6 \neq 8040$
13. 15cm²
14. 11
15. 3072cm³
16. 225cm²