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## National 5 Maths Similar Shapes

SQA past paper and specimen paper  
questions and answers by topic

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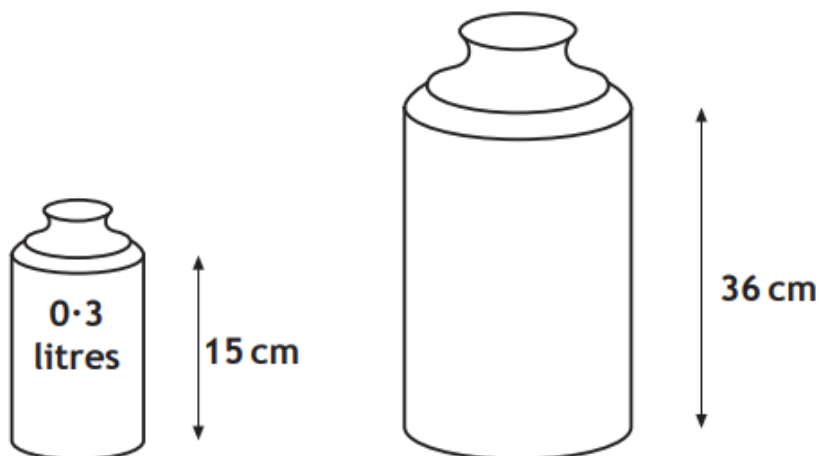
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Screenwash is available in two different sized bottles, 'Mini' and 'Maxi'.  
The bottles are mathematically similar.



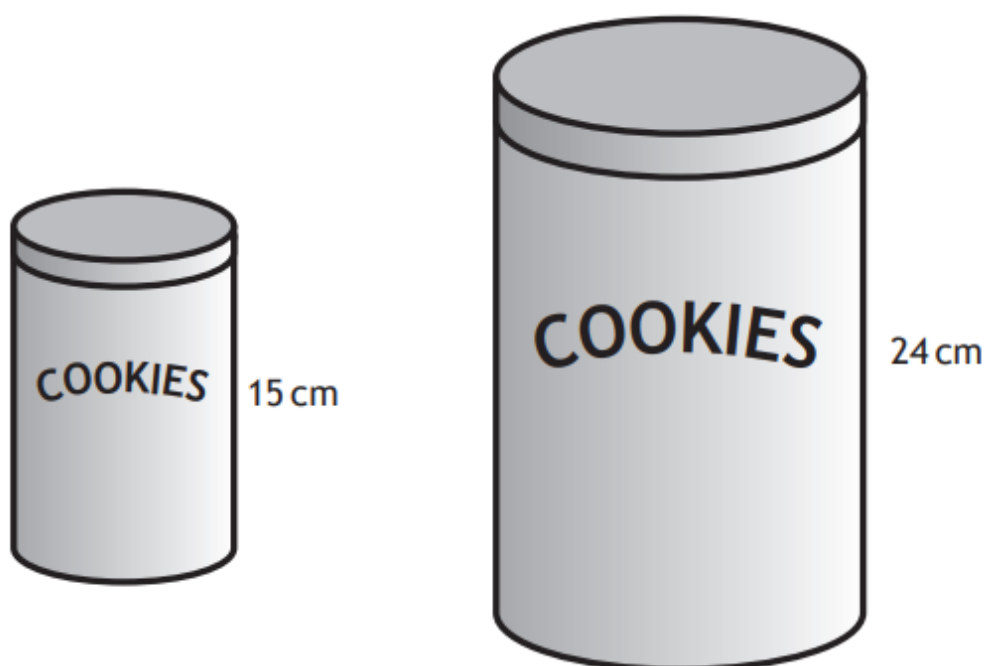
Calculate the volume of the 'Maxi' bottle.

3

Answer:

4.15 litres

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.

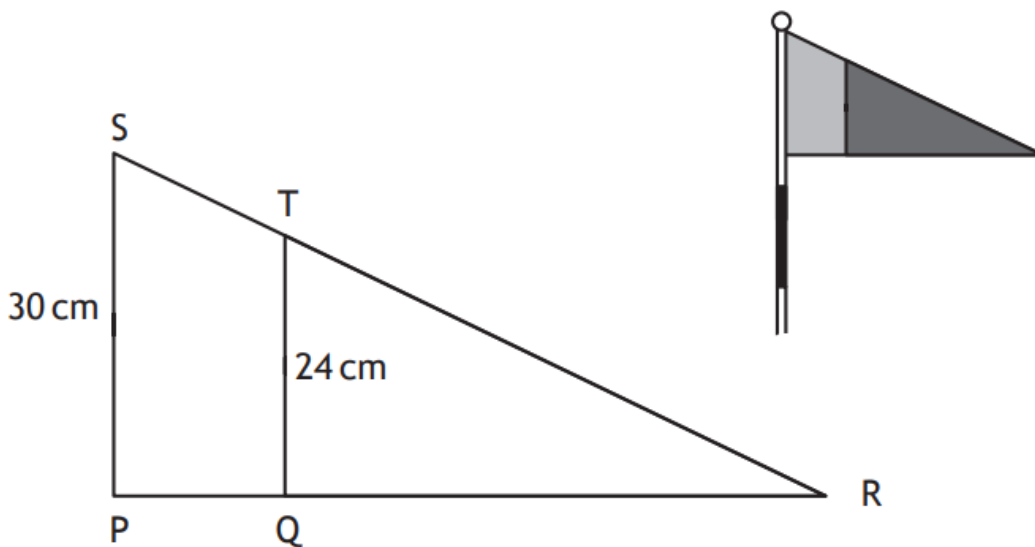
3

Answer:

$3072 \text{ cm}^3$

National 5 Maths  
SQA 2015 Paper 2  
Question 9

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

Answer:

225 cm<sup>2</sup>

Two pictures are mathematically similar in shape.



100 cm



60 cm

The cost of each picture is proportional to its area.

The large picture costs £13.75.

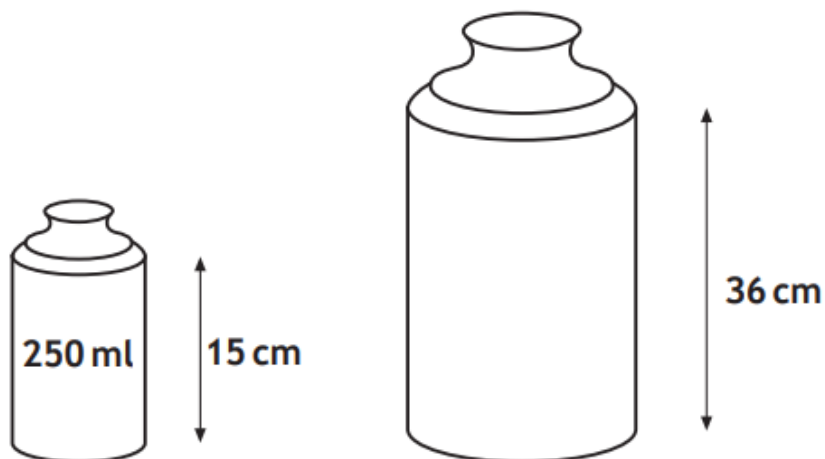
Find the cost of the small picture.

3

Answer:

£4.95

Screenwash is available in bottles which are mathematically similar.



The smaller bottle has a height of 15 centimetres and a volume of 250 millilitres.  
The larger bottle has a height of 36 centimetres.

Calculate the volume of the larger bottle.

3

Answer:

3456 ml

National 5 Maths  
SQA 2017 Paper 1  
Question 15

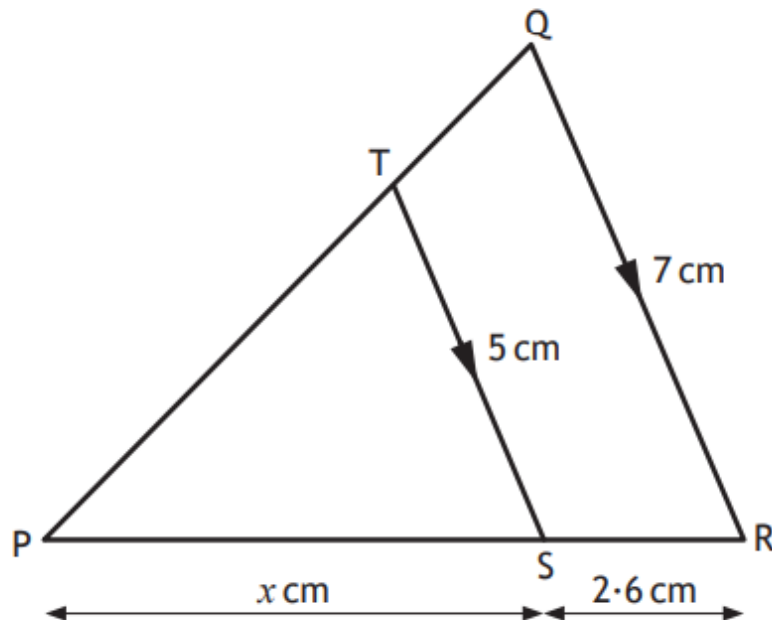
National 5 Maths

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In the diagram below:

- TS is parallel to QR
- TS = 5 centimetres
- QR = 7 centimetres
- SR = 2.6 centimetres



The length of PS is  $x$  centimetres.

Calculate the value of  $x$ .

3

Answer:

$$x = 6.5 \text{ or } x = \frac{13}{2}$$

A cinema sells popcorn in two different sized cartons.



The small carton is 16 centimetres deep and has a volume of 576 cubic centimetres.

The large carton is 24 centimetres deep and has a volume of 1125 cubic centimetres.

(a) Show that the two cartons are **not** mathematically similar. 3

The large carton is redesigned so that the two cartons are **now** mathematically similar.

The volume of the redesigned large carton is 1500 cubic centimetres.

(b) Calculate the depth of the redesigned large carton. 2

Answers:

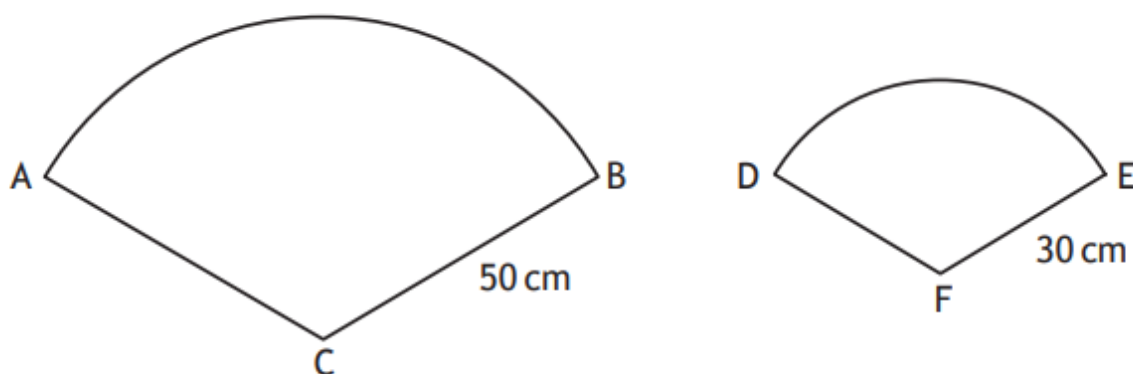
(a) See marking instructions for acceptable methods.

(b) 22.0 cm



In the diagram

- ABC is a sector of a circle, centre C
- DEF is a sector of a circle, centre F.



The sectors are mathematically similar.

The area of the larger sector, ABC, is 2750 square centimetres.

- (a) Calculate the area of the smaller sector, DEF. 3
- (b) Calculate the size of angle ACB. 3

Answers:

- (a)  $990 \text{ cm}^2$   
(b)  $126.1^\circ$

The two photographs shown are mathematically similar.



12 cm



width

The small photograph has an area of 80 square centimetres, and is 12 centimetres wide.

The large photograph has an area of 500 square centimetres.

Calculate the width of the large photograph.

3

Answer:

30 cm