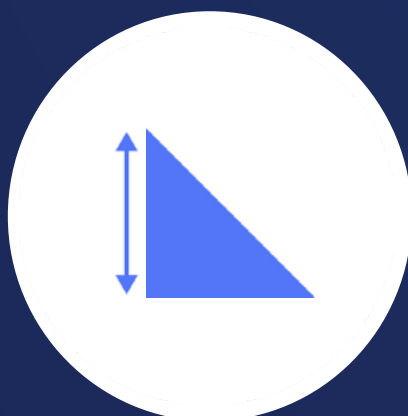


Sparx Maths

Crossover Workbook 4

Geometry



sparxmaths.com

In this series of six workbooks, there are a range of questions from key crossover topics that appear in both the GCSE Foundation and Higher tier papers.

Each workbook will focus on a particular strand of maths.

Workbook 4 will cover **Geometry** topics.

The contents of Workbooks 1-6 are shown below.

1 Number

- Fractions
- Factors, multiples and primes
- Percentage change
- Standard form
- Error intervals

2 Algebra

- Solving linear equations
- Linear inequalities
- Index laws
- Linear simultaneous equations
- Linear graphs and coordinates
- Quadratic graphs and equations

3 Ratio & Proportion

- Ratio
- Speed
- Density and pressure
- Proportion

4 Geometry

- Area
- Volume
- Angles
- Pythagoras' theorem
- Trigonometry
- Transformations

5 Probability

- Calculating probabilities
- Expected outcomes
- Tree diagrams
- Set notation

6 Statistics

- Averages
- Averages with grouped data
- Sampling
- Scatter graphs
- Frequency polygons

This workbook is split into two sections:

- **Introduce** questions are fluency questions on each topic to practise the key concepts.
- **Deepen** mixed topic questions are more challenging reasoning and problem solving questions.

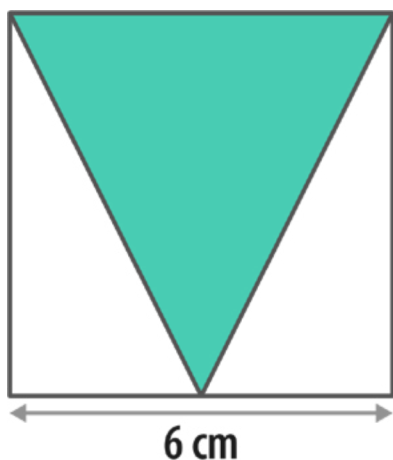
Use the list below to keep track of your progress in each topic. If you use Sparx Maths you can find even more questions by searching for the Sparx topic codes in Independent Learning.

	Sparx topic codes	Teacher comment
Area	U226 U343 U950	
Volume	U786 U174 U915	
Angles	U655 U826 U329 U427	
Pythagoras' theorem	U385	
Trigonometry	U605 U283 U545	
Transformations	U196 U799 U696 U519 U766	



Calculators may be used in all questions

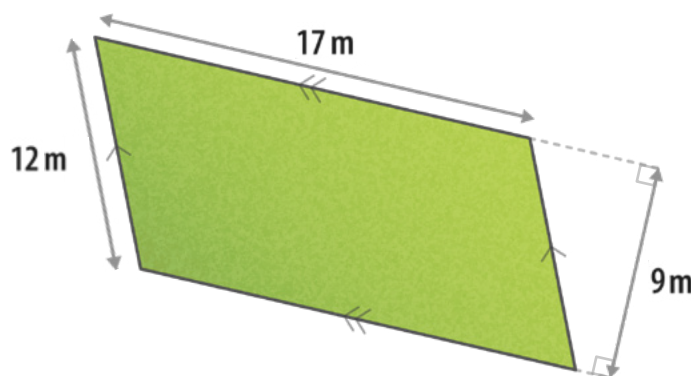
- Q1** The diagram below shows a shaded triangle inside a square.
What is the area of the shaded triangle?



Not drawn accurately

Answer: cm^2

- Q2** The diagram shows a lawn in the shape of a parallelogram.
A packet of grass seed provides enough seeds to cover an area of 10 m^2 .
How many packets of grass seed need to be bought to cover the entire lawn?

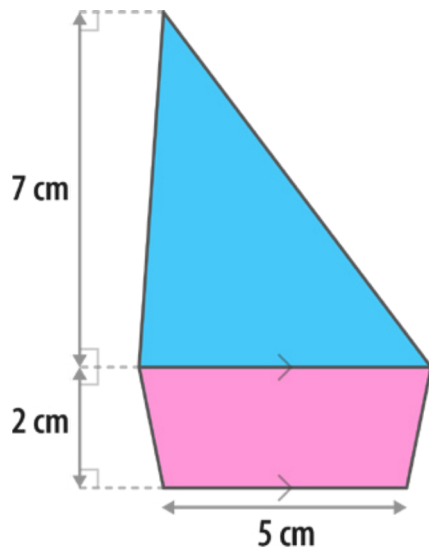


Not drawn accurately

Answer:

- Q3** The shape below is made of a triangle and a trapezium.
The area of the triangle is 21 cm^2 .

Work out the area of the trapezium.

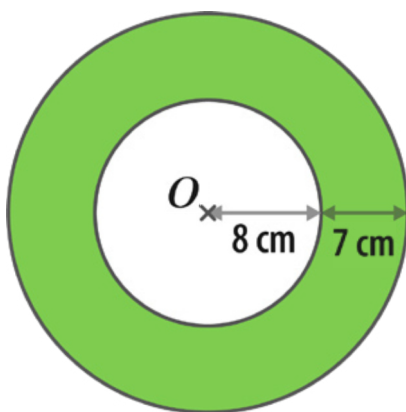


Not drawn accurately

Answer: cm^2

- Q4** The diagram shows a logo made from two circles.
Both circles have centre O .

Calculate the area of the shaded region.
Give your answer to 3 significant figures.

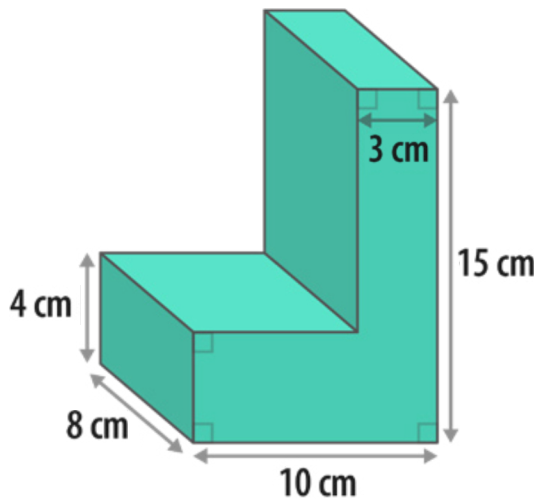


Not drawn accurately

Answer: cm^2

Q1

Work out the volume of the prism below.



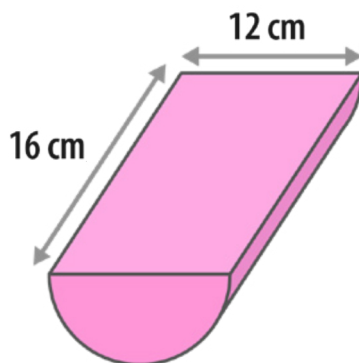
Not drawn accurately

Answer:cm³

Q2

The cross-section of the solid below is a semicircle.

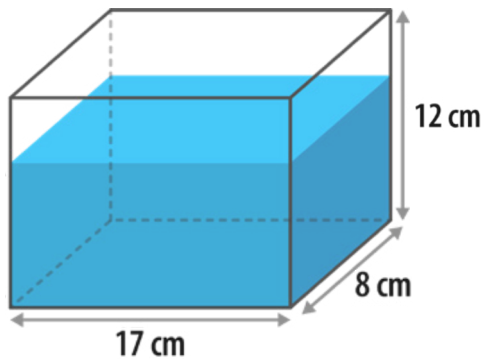
Work out the volume of the solid.
Give your answer to 3 significant figures.



Not drawn accurately

Answer:cm³

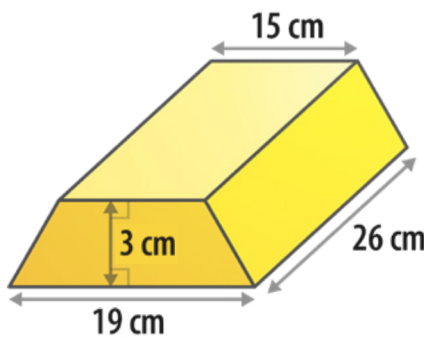
- Q3** $\frac{3}{4}$ of the cuboid-shaped container below is filled with water.
Work out how many millilitres of water are in the container.
 $1 \text{ ml} = 1 \text{ cm}^3$



Not drawn accurately

Answer: ml

- Q4** The gold bar below is a prism and its cross-section is a trapezium.



Not drawn accurately

- a) Calculate the volume of the gold bar.

Answer: cm^3

The gold bar has a mass of 26 kg.

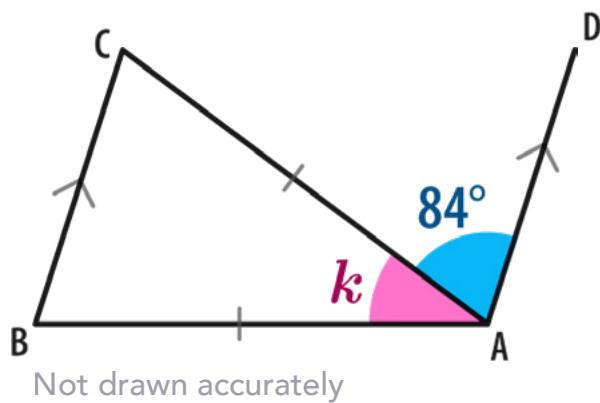
- b) Calculate the density of the gold bar in g/cm^3 .
Give your answer to one decimal place.

Answer: g/cm^3

Q1

Find the size of the angle marked k .

Give reasons for your answer.



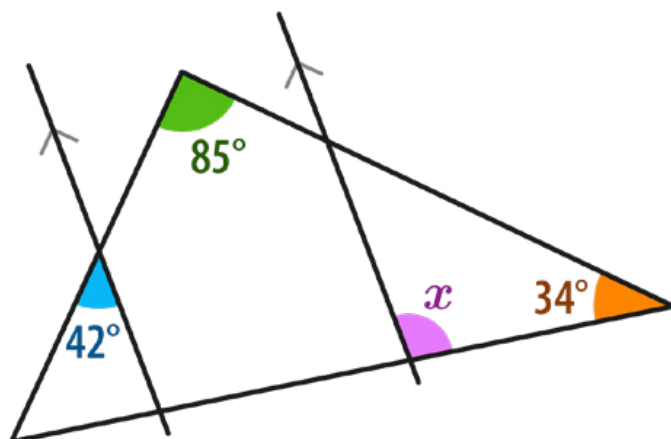
Q2

A regular polygon has 24 sides.

What is the size of an interior angle of this polygon?

Answer:°

Q3

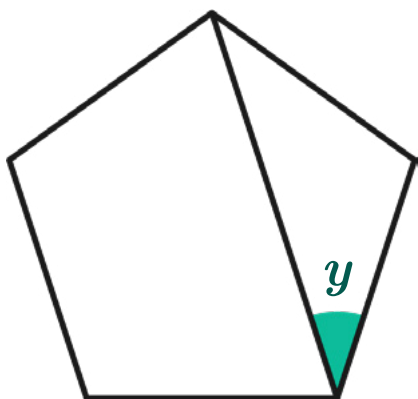
Find the size of angle x .

Not drawn accurately

Answer:°

Q4

The shape shown is a regular pentagon.

Find the size of angle y .

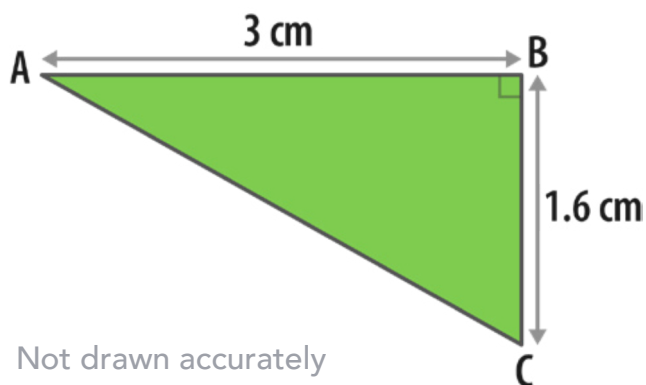
Not drawn accurately

Answer:°

Q1

Calculate the length of AC.

Give your answer to one decimal place.

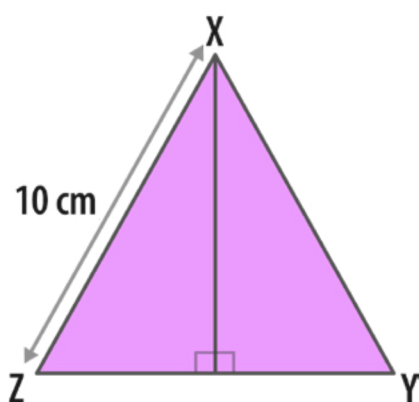


Answer:cm

Q2

Calculate the height of the equilateral triangle below.

Give your answer to one decimal place.

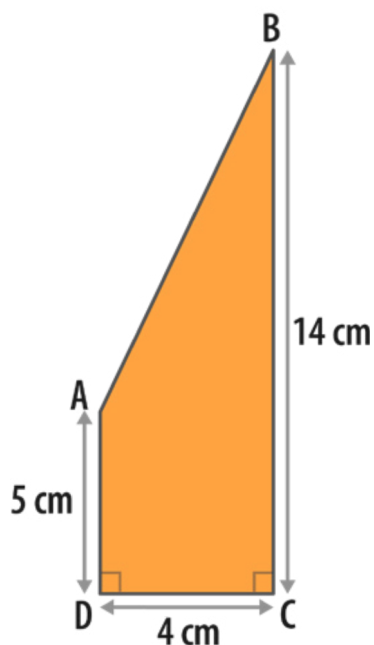


Answer:cm

Q3

Calculate the perimeter of the trapezium below.

Give your answer to one decimal place.



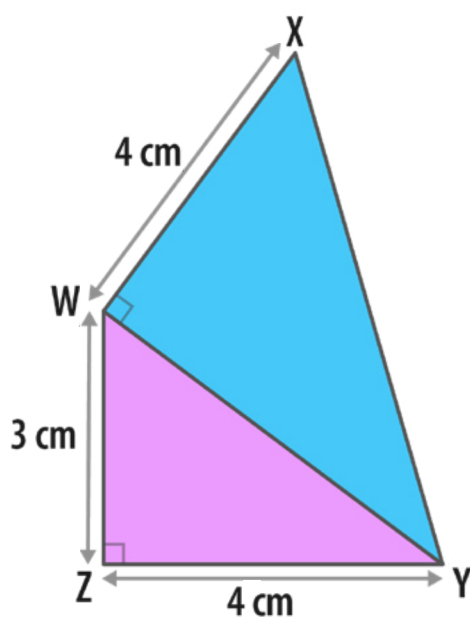
Not drawn accurately

Answer: cm

Q4

Calculate the length of XY.

Give your answer to one decimal place.



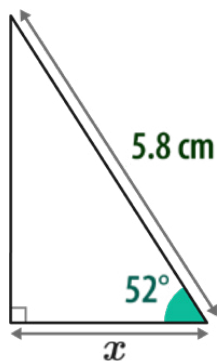
Not drawn accurately

Answer: cm

Q1

Work out the length x .

Give your answer to two decimal places.



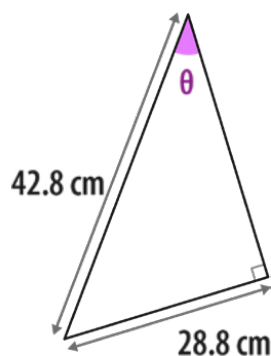
Not drawn accurately

Answer: cm

Q2

Work out the size of angle θ .

Give your answer to one decimal place.



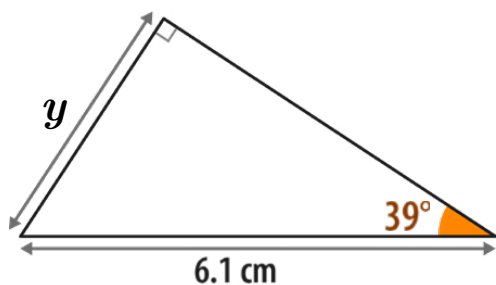
Not drawn accurately

Answer: °

Q3

Work out the length y .

Give your answer to one decimal place.



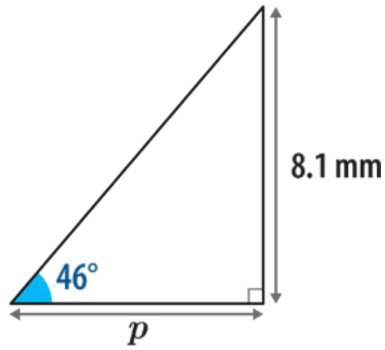
Not drawn accurately

Answer: cm

Q4

Work out the length p .

Give your answer to one decimal place.



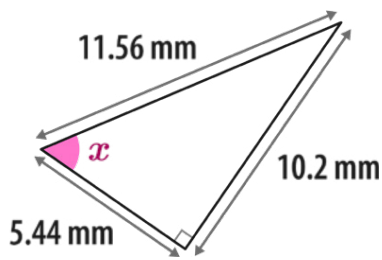
Not drawn accurately

Answer: mm

Q5

Work out the size of angle x .

Give your answer to one decimal place.



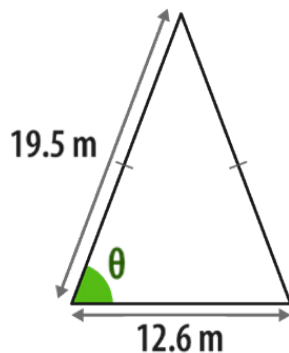
Not drawn accurately

Answer: °

Q6

Work out the size of angle θ in the isosceles triangle below.

Give your answer to one decimal place.

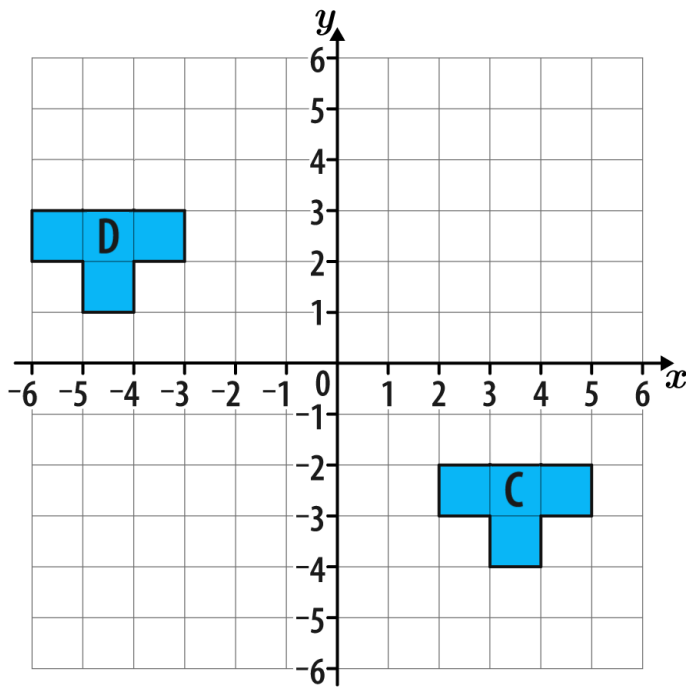


Not drawn accurately

Answer: °

Q1

Describe fully the single transformation that maps shape C to shape D.

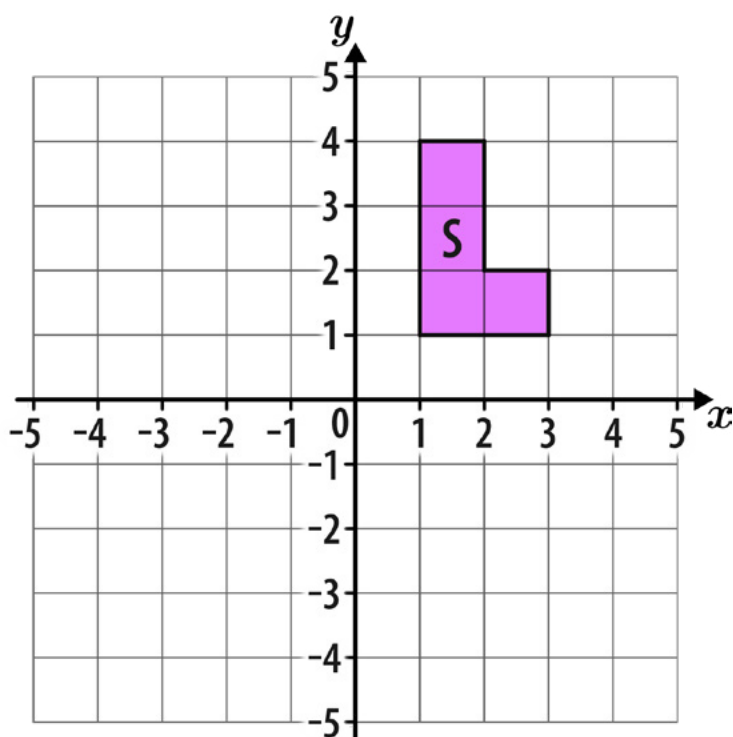


Answer:

.....

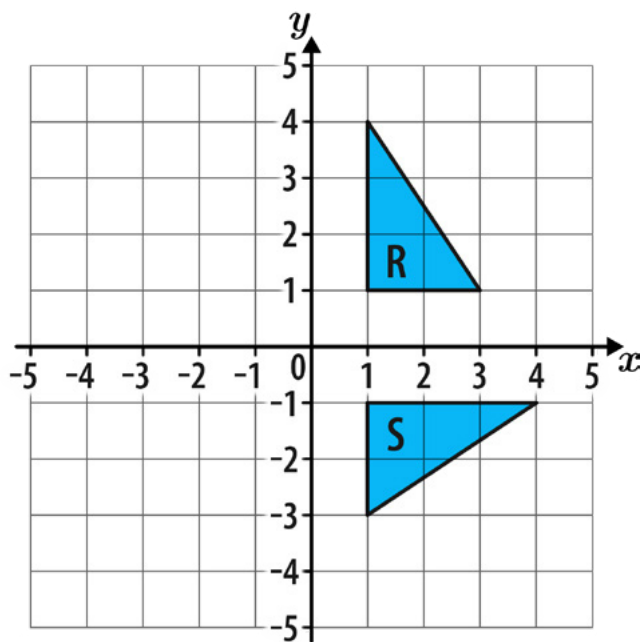
Q2

Reflect shape S in the line $x = 0$



Q3

Describe fully the single transformation that maps shape R to shape S.

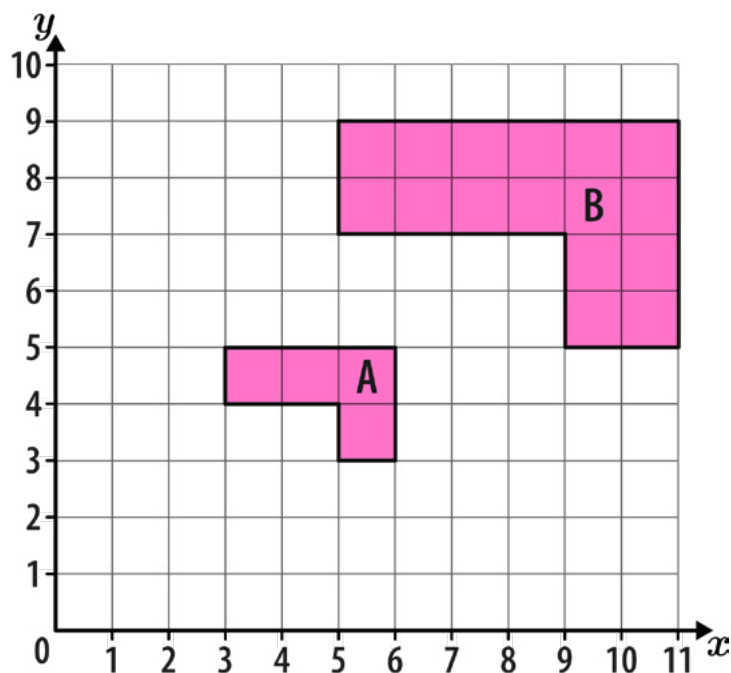


Answer:

.....

Q4

Describe fully the single transformation that maps shape A to shape B.



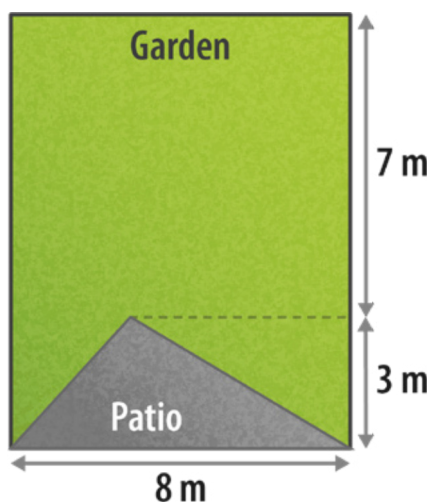
Answer:

.....

Q1

What fraction of this rectangular garden is taken up by the patio?

Give your answer as a fraction in its simplest form.

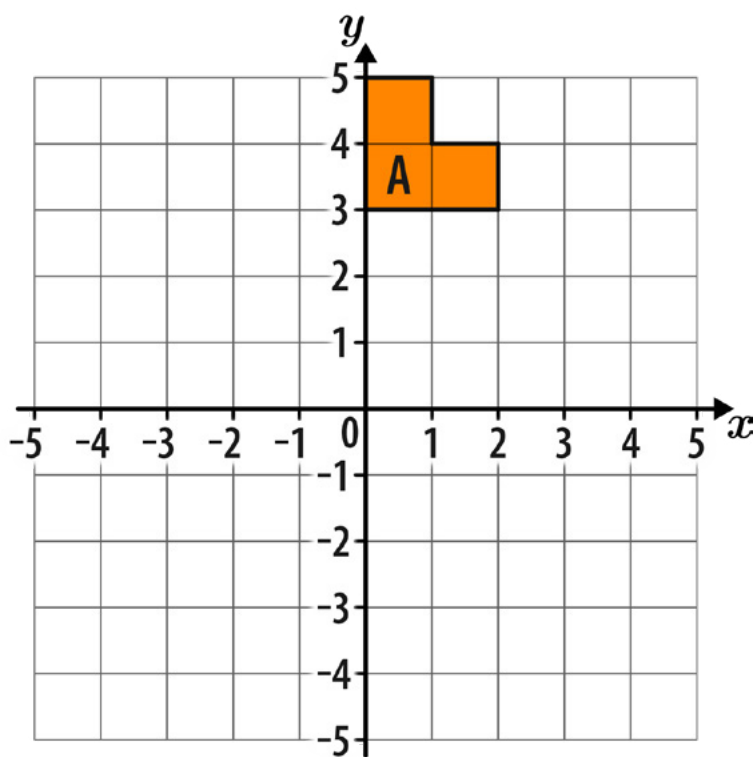


Not drawn accurately

Answer:

Q2

Reflect Shape A in the line $y = -x$



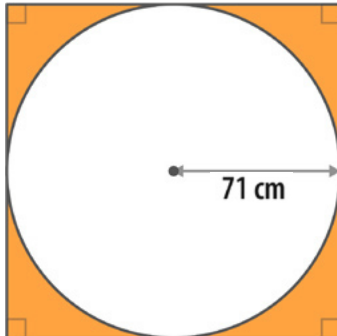
Q3

A circle is drawn inside a square so that the edge of the circle touches the midpoint of each side of the square, as shown below.

The radius of the circle is 71 cm.

What percentage of the square is shaded?

Give your answer to one decimal place.

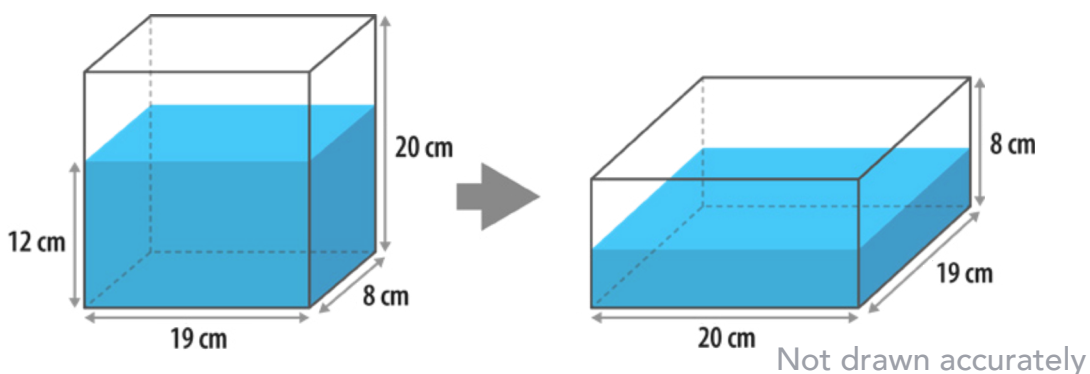


Not drawn accurately

Answer:

Q4

A sealed cuboid-shaped container is filled with water to a depth of 12 cm. The container is then rotated as shown below.

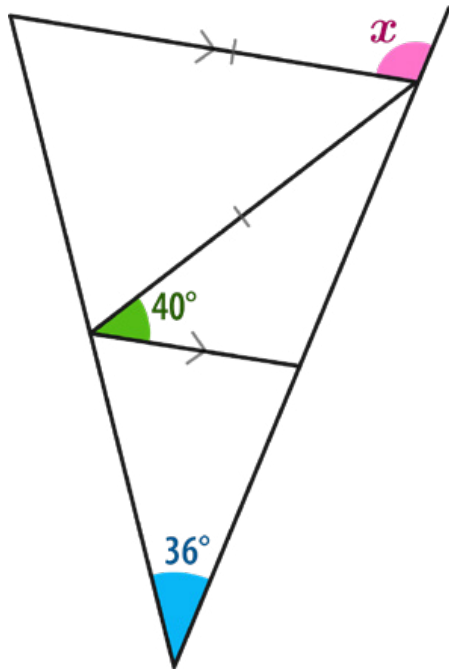


What is the new depth of the water?

Answer:cm

Q5

Work out the size of angle x in the diagram below.



Not drawn accurately

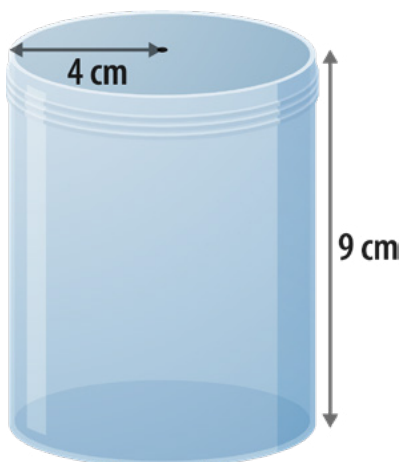
Answer:°

Q6

The cylindrical jar below is filled with water at a rate of 20 ml per second.

Work out how long it will take to fill $\frac{2}{3}$ of the jar.

Give your answer to the nearest second.



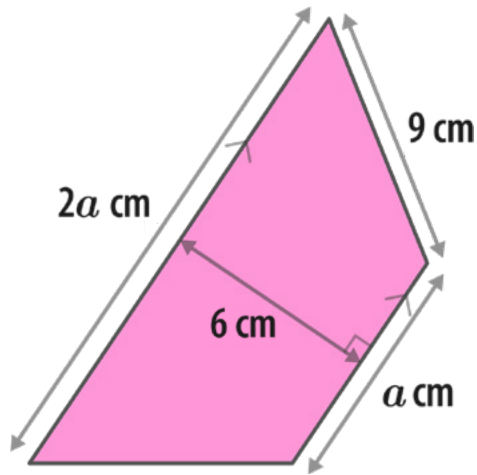
Not drawn accurately

Answer:seconds

Q7

The area of this trapezium is 72 cm^2 .

Find the value of a .



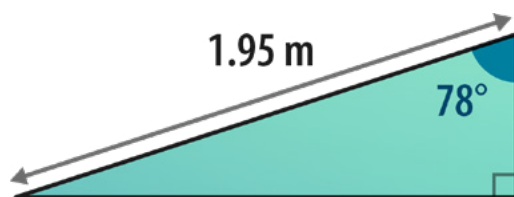
Not drawn accurately

Answer:

Q8

Calculate the perimeter of the triangle below.

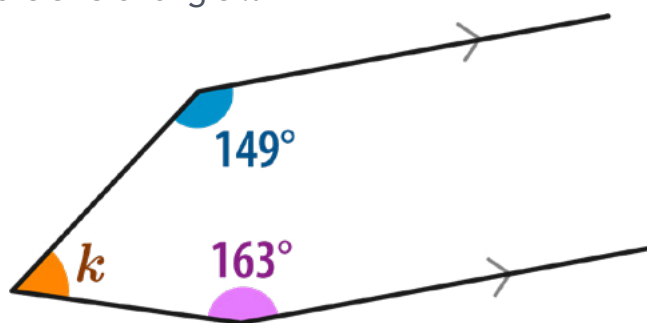
Give your answer to one decimal place.



Not drawn accurately

Answer:m

Q9

Work out the size of angle k .

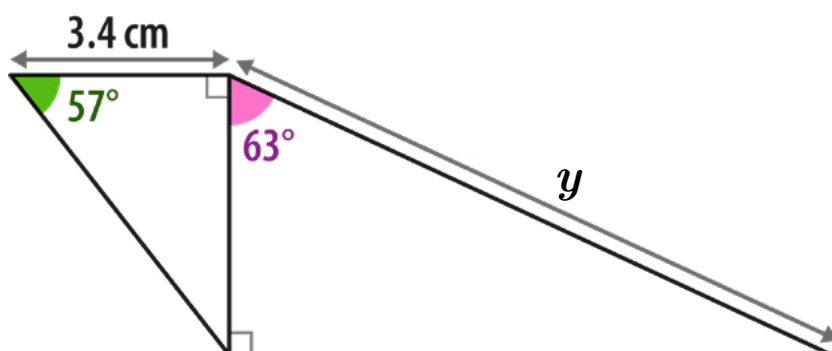
Not drawn accurately

Answer:°

Q10

Calculate the length y .

Give your answer to two decimal places.



Not drawn accurately

Answer:cm

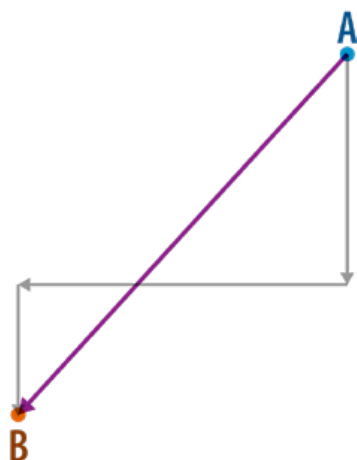
Q11

John started at point A and walked 40 m south, 50 m west and further 20 m south to arrive at point B.

Melanie started at point A and walked in a straight line to point B.

How much further did John walk than Melanie?

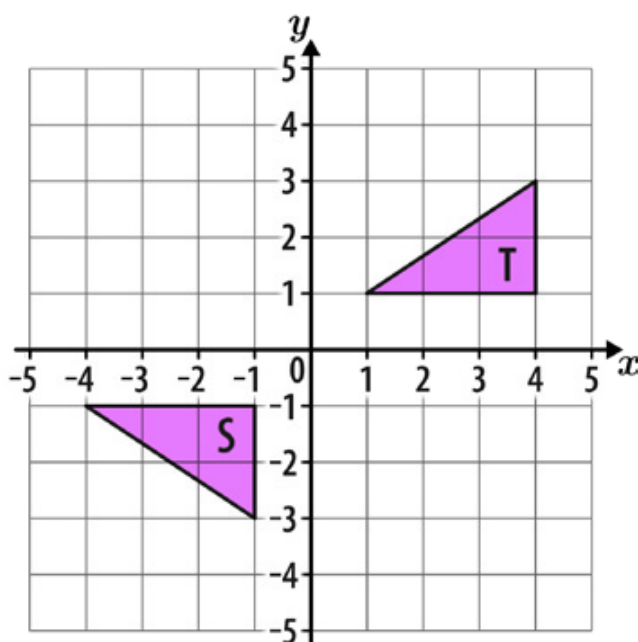
Give your answer to one decimal place.



Not drawn accurately

Answer:m

Q12



Shape S can be transformed to Shape T by a reflection in $y = 1$ followed by a

translation $\begin{pmatrix} a \\ b \end{pmatrix}$

Find the value of a and the value of b .

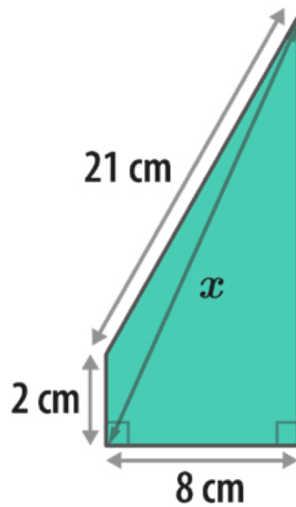
$a =$ $b =$

Q13

A trapezium is shown below.

Calculate the length of x .

Give your answer to one decimal place.



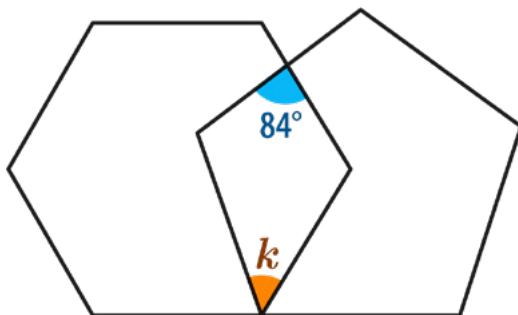
Not drawn accurately

Answer: cm

Q14

A regular hexagon and a regular pentagon overlap to form a quadrilateral, as shown.

Calculate the size of the angle marked k .



Not drawn accurately

Answer: °

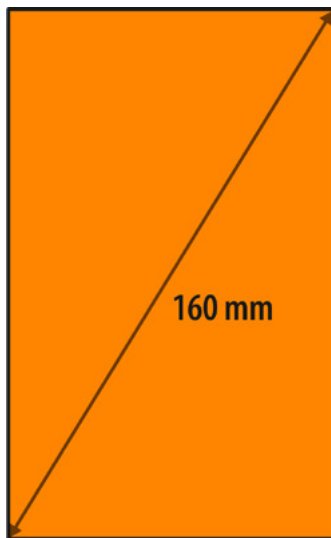
Q15

A rectangle is shown below.

The ratio of the width to the height of the rectangle is 1 : 2

Calculate the width of the rectangle.

Give your answer to two decimal places.



Not drawn accurately

Answer: mm

Q16

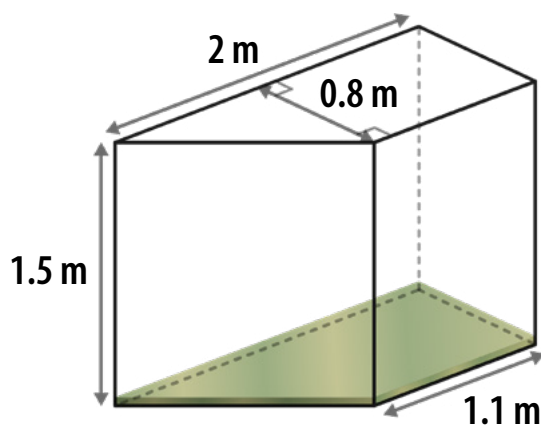
Petrol is poured at a constant rate into the container shown below.

The container is a prism, and its cross-section is a trapezium.

It takes 1 minute for the tank to contain 24 litres of petrol.

How many minutes would it take for the container to be 80% full of petrol?

$1\text{m}^3 = 1\,000$ litres



Not drawn accurately

Answer: minutes



1 hour of Sparx Maths a week significantly improves student grades



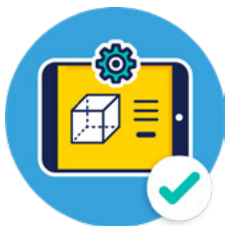
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