



KING EDWARD VI
HANDSWORTH GRAMMAR
SCHOOL FOR BOYS



KING EDWARD VI
ACADEMY TRUST
BIRMINGHAM

Year 7

Mathematics

Unit 4 Student

2026

2027

HGS Maths



Tasks



Dr Frost Course



Name: _____

Class: _____

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1 Rounding

1.1 Rounding to the Nearest Multiple

1.2 Rounding to Decimal Places

Worked Example	Your Turn
Round 8.7337 to: a) 1 decimal place b) 2 decimal places c) 3 decimal places d) Nearest Integer	Round 8.3773 to: a) 1 decimal place b) 2 decimal places c) 3 decimal places d) Nearest Integer

1.3 Rounding to Significant Figures

Worked Example

Circle the 2nd significant figure:

7 8 0 0

7 0 0 8

7 . 0 0 8

0 . 0 0 7 8

0 . 7 0 0 8

Your Turn

Circle the 2nd significant figure:

1) 4 5 6

2) 4 0 6

3) 4 0 0

4) 4 0 0 0

5) 4 5 0 0

6) 4 5 0 6

7) 4 5 . 0 6

8) 4 . 5 0 6

9) 0 . 4 5 0 6

10) 0 . 0 4 5 0 6

11) 0 . 0 0 4 5 0 6

12) 0 . 0 0 4 0 0 6

13) 3 . 0 0 4 0 0 6

14) 0 . 3 0 4 0 0 6

Worked Example

1) 8 Number of significant figures =

2) 0.8 Number of significant figures =

3) 800 Number of significant figures =

4) 0.800 Number of significant figures =

5) 0.008 Number of significant figures =

Your Turn

1) 456	Number of significant figures =
2) 450	Number of significant figures =
3) 406	Number of significant figures =
4) 400	Number of significant figures =
5) 40	Number of significant figures =
6) 4	Number of significant figures =
7) 0.4	Number of significant figures =
8) 0.40	Number of significant figures =
9) 0.04	Number of significant figures =
10) 0.004	Number of significant figures =
11) 0.00456	Number of significant figures =
12) 0.456	Number of significant figures =
13) 0.406	Number of significant figures =
14) 0.450	Number of significant figures =
15) 0.4500	Number of significant figures =
16) 0.45006	Number of significant figures =
17) 0.450067	Number of significant figures =
18) 450067	Number of significant figures =
19) 45067	Number of significant figures =
20) 4506.7	Number of significant figures =
21) 450.67	Number of significant figures =
22) 45.067	Number of significant figures =
23) 45.0067	Number of significant figures =
24) 4.50067	Number of significant figures =
25) 4.00067	Number of significant figures =
26) 0.00067	Number of significant figures =
27) 0.0067	Number of significant figures =
28) 6.0007	Number of significant figures =
29) 0.6007	Number of significant figures =
30) 0.0607	Number of significant figures =

Fluency Practice

Number	1dp	2dp	1sf	2sf	3sf
123.456					
144.402					
8888.888					
437.3946					
987.654					
3 809 830.492					
1.98043					
4.80808					
99.009900					

2 Metric Units

Conversions

Unit of measurement	Useful conversions	Examples – what would usually be measured in these units?
<i>Distance</i>		
Millimetres (mm)		
Centimetres (cm)		
Metres (m)		
Kilometres (km)		
<i>Weight</i>		
Grams (g)		
Kilograms (kg)		
Tonnes (T)		
<i>Capacity</i>		
Millilitres (ml)		
Litres (l)		

2.1 Metric Units of Length

The commonly used metric units of length include:

- kilometre (km)
- metre (m)
- centimetre (cm)
- millimetre (mm)

2.2 Metric Units of Mass

The commonly used metric units of mass include:

- tonne (T)
- kilogram (kg)
- gram (g)

2.3 Metric Units of Capacity

The commonly used metric units of capacity include:

- litre (l)
- centilitre (cl)
- millilitre (ml)

2.4 Metric Units of Time

The commonly used metric units of time include:

- second (s)
- minute (min)
- hour (hr)

3 Properties of 2D Shapes

3.1 Names of 2D Shapes



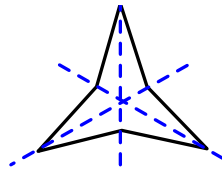
3.2 Line Symmetry

Fluency Practice

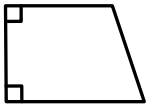
learn by heart

If a shape is reflected through a **line of symmetry**, the result is the same shape.

If you fold a shape through a line of symmetry, the two halves fit perfectly over each other.



This shape has **3** lines of symmetry.



A right-angled trapezium has **0** lines of symmetry.

exercise 3d

1. Draw in all of the lines of symmetry for each shape, and state how many there are:

Square	Isosceles Trapezium	Rhombus	Kite	Rectangle
Parallelogram	Equilateral Triangle	Regular Pentagon	Regular Hexagon	Regular Octagon

2. A triangle has exactly one line of symmetry.
What is the name for this type of triangle?

3. Which **one** of the following shapes **does not have 4 lines of symmetry**?

P	Q	R	S
----------	----------	----------	----------

4. Sort these letters into the correct groups, based on their lines of symmetry:

A	C	E	F	H	L	M	N	P	S	T	Z
No lines of symmetry				1 line of symmetry				2 lines of symmetry			

3.3 Rotational Symmetry

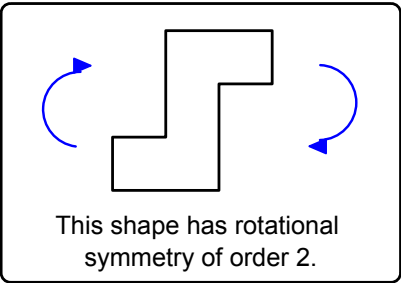
Fluency Practice

learn by heart

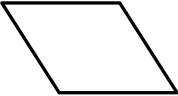
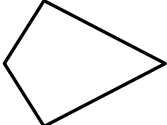
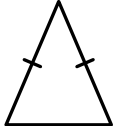
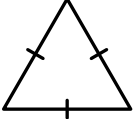
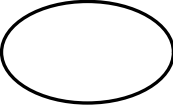
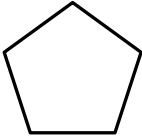
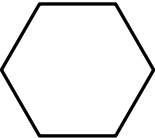
A shape has **rotational symmetry** if it looks exactly the same after rotating by less than a full turn.

A shape's **order of rotational symmetry** is the number of times it looks the same in a full turn.

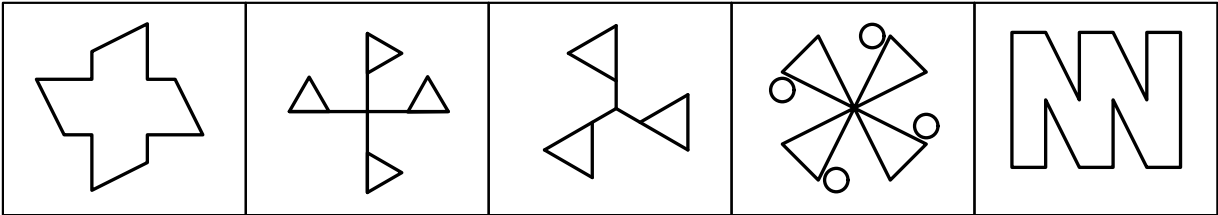
exercise 3f



1. State the order of rotational symmetry of each shape, or write 'none' if the shape has no rotational symmetry.

				
Square	Rectangle	Trapezium	Parallelogram	Kite
				
Isosceles Triangle	Equilateral Triangle	Ellipse	Regular Pentagon	Regular Hexagon

2. State the order of rotational symmetry of a regular octagon.
3. Sketch a hexagon with a rotational symmetry of order 2.
4. State the order of rotational symmetry of each drawing, or write 'none' if the drawing has no rotational symmetry.

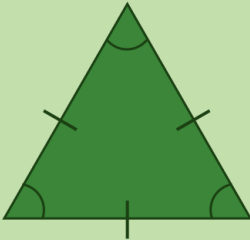


5. **D E G H I M N S U W X Z**

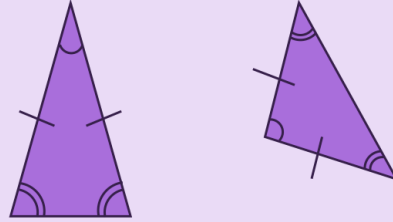
- a) Which of the letters have rotational symmetry?
- b) Which of the letters have rotational symmetry **and** at least 1 line of symmetry?

3.4 Types and Properties of Triangles

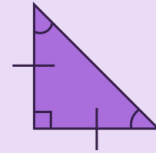
Equilateral



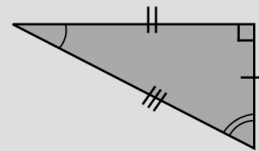
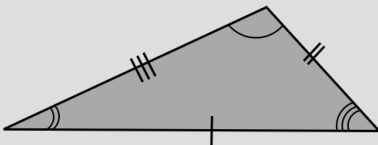
Isosceles



Right-angled



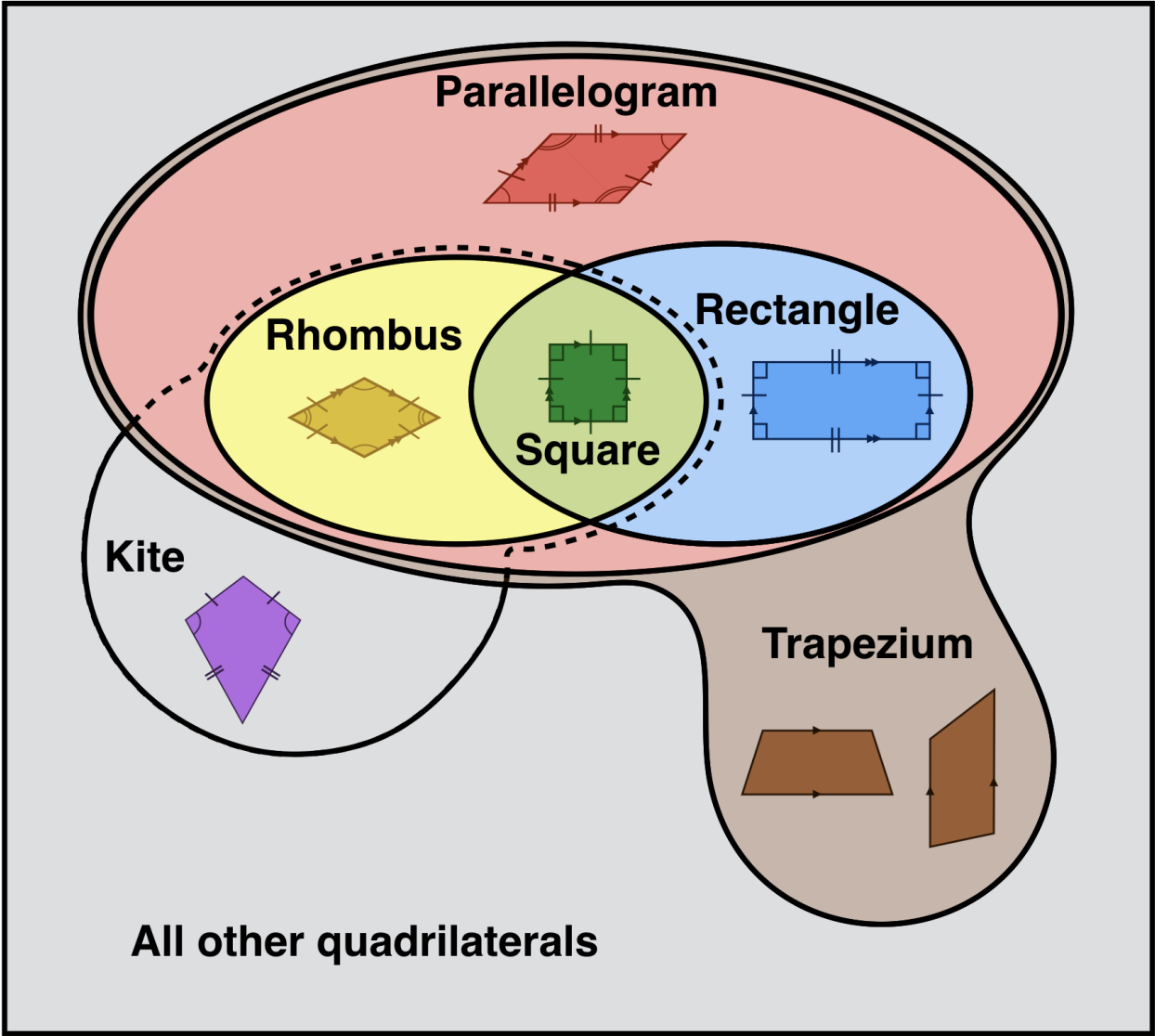
Scalene



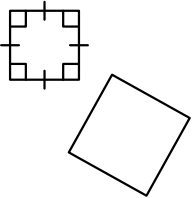
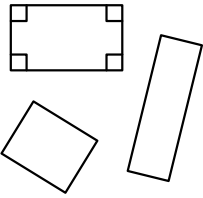
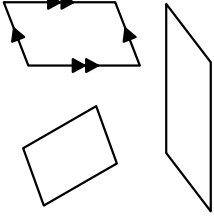
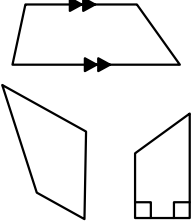
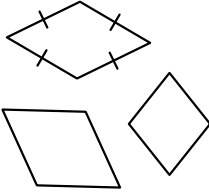
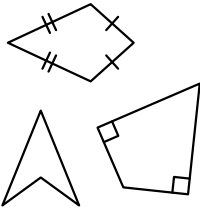
Types and Properties of Triangles

Name	Examples	Properties
Equilateral		
Isosceles		
Scalene		
Right-Angled		

3.5 Types and Properties of Quadrilaterals



Types and Properties of Quadrilaterals

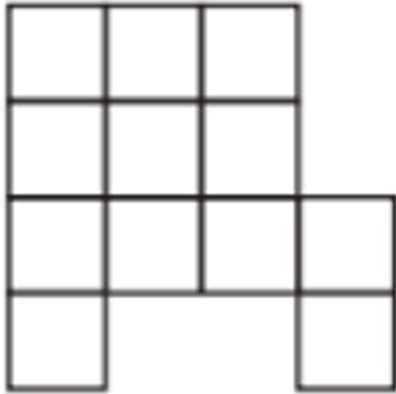
Name	Examples	Properties	Diagonals
Square			
Rectangle			
Parallelogram			
Trapezium			
Rhombus			
Kite			

4 Area and Perimeter

4.1 Perimeter on a Grid

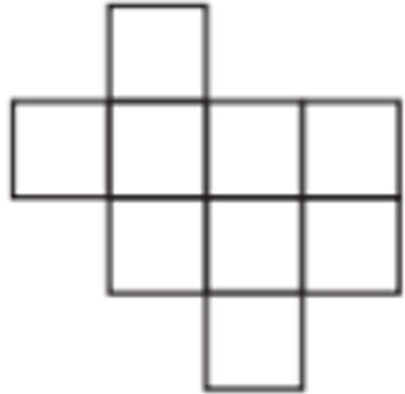
Worked Example

Calculate the perimeter of the shape below:

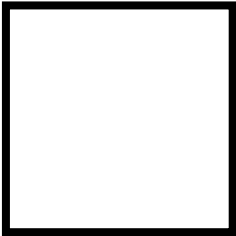
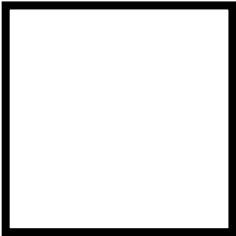


Your Turn

Calculate the perimeter of the shape below:

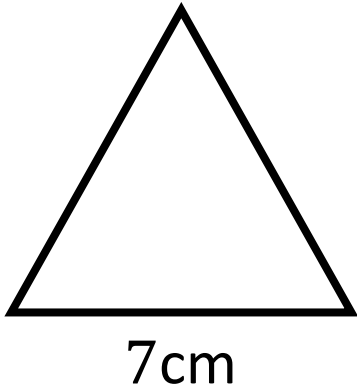


4.2 Perimeter

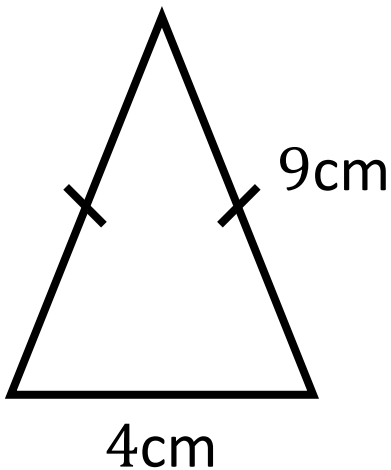
Worked Example	Your Turn
a) Calculate the perimeter of the rectangle: 6cm  2cm b) Calculate the perimeter of the square: 3cm 	a) Calculate the perimeter of the rectangle: 12cm  4cm b) Calculate the perimeter of the square: 6cm 

Worked Example

- a) Calculate the perimeter of the equilateral triangle:

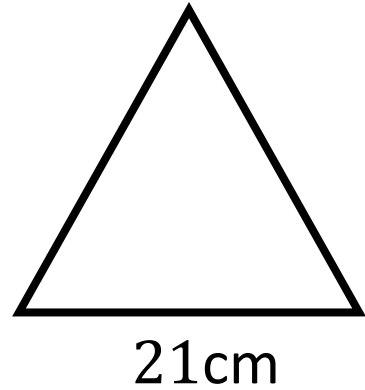


- b) Calculate the perimeter of the isosceles triangle:

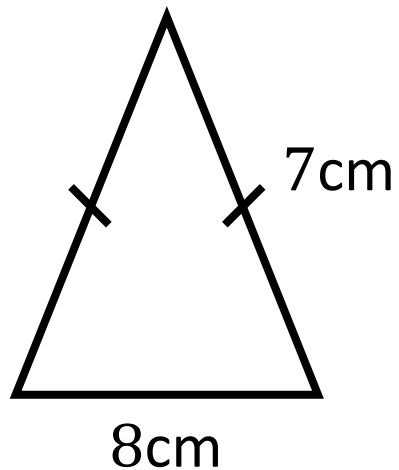


Your Turn

- a) Calculate the perimeter of the equilateral triangle:

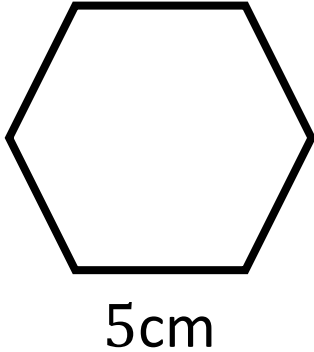


- b) Calculate the perimeter of the isosceles triangle:

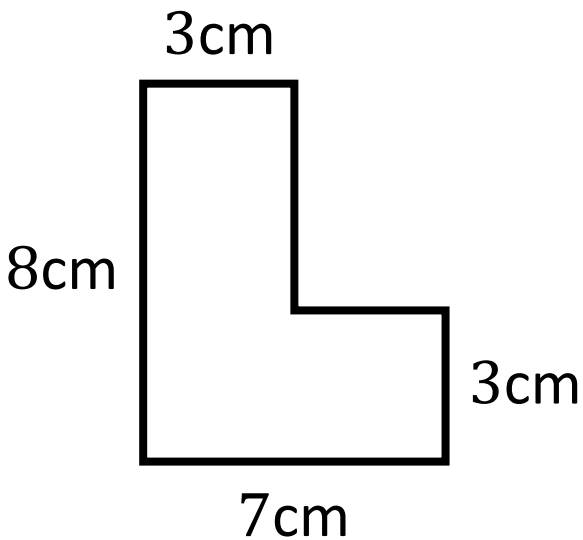


Worked Example

- a) Calculate the perimeter of the regular hexagon:

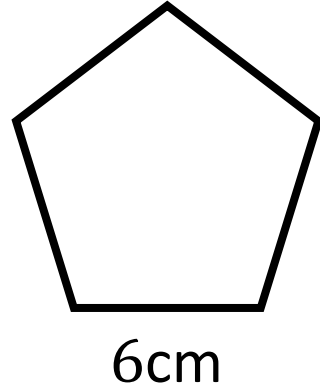


- b) Calculate the perimeter of the shape below:

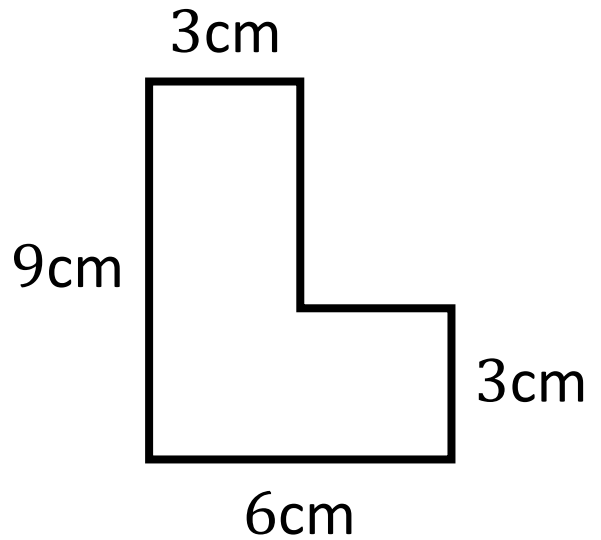


Your Turn

- a) Calculate the perimeter of the regular pentagon:

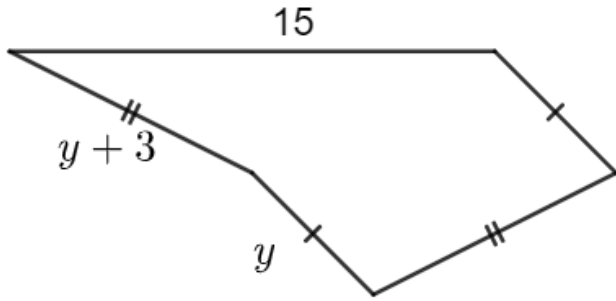


- b) Calculate the perimeter of the shape below:



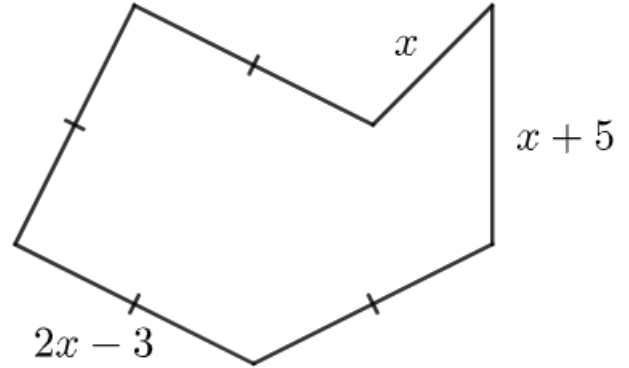
Worked Example

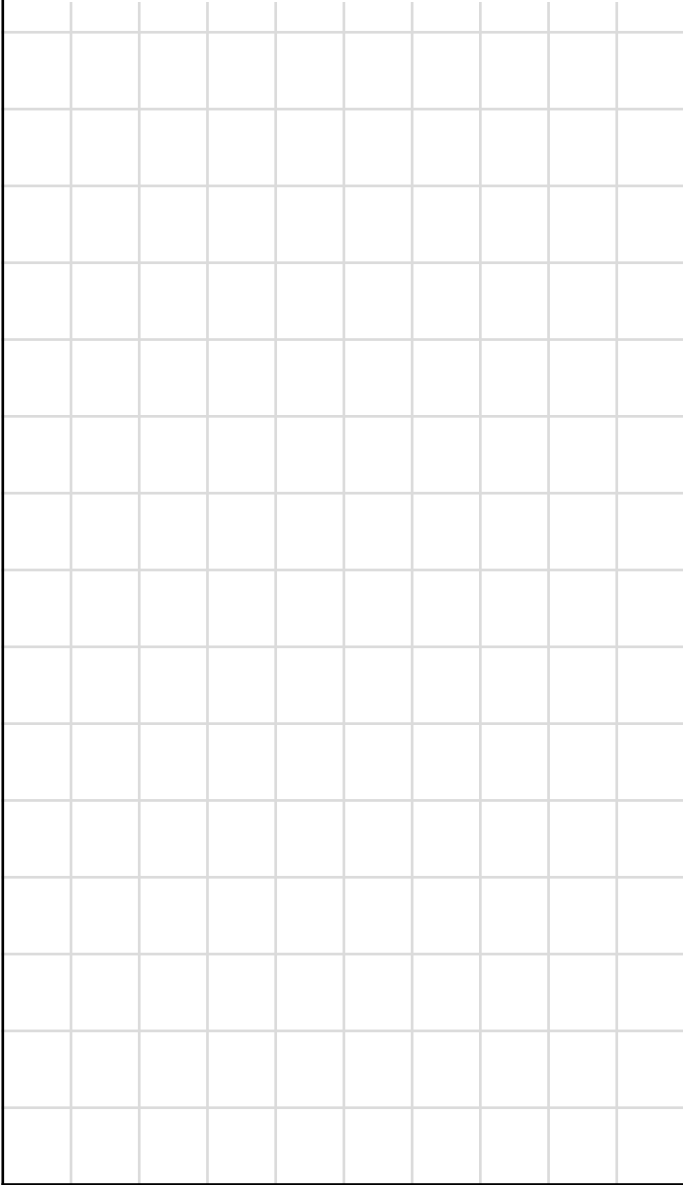
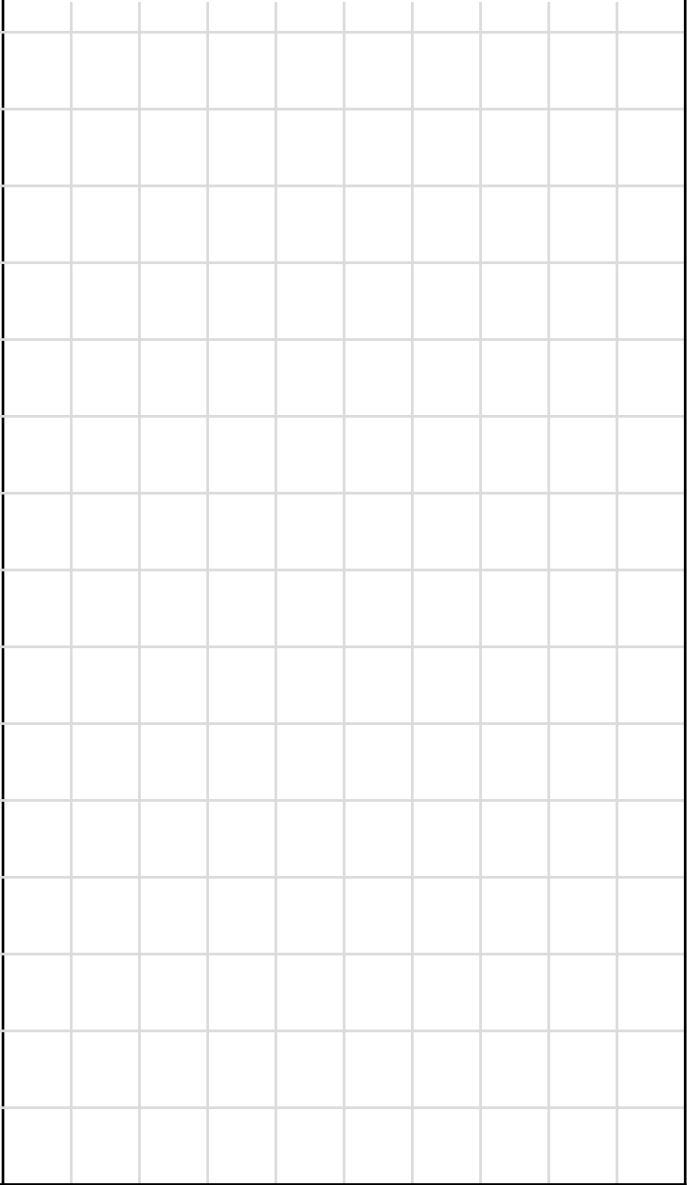
Find an expression for the perimeter of the following shape:

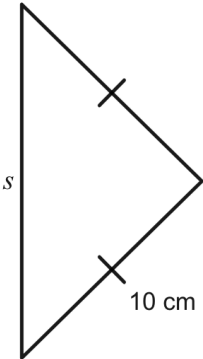
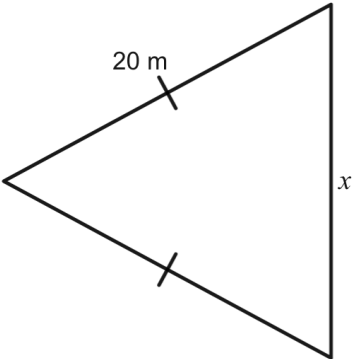


Your Turn

Find an expression for the perimeter of the following shape:

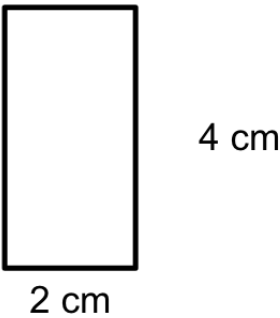


Worked Example	Your Turn
Calculate the length of x if the perimeter of the rectangle is 44cm: 15cm  xcm 	Calculate the length of x if the perimeter of the rectangle is 88cm: 15cm  xcm 

Worked Example	Your Turn
a) A regular octagon has a perimeter of 48 cm. Calculate the length of one side of the octagon. b) An isosceles triangle is drawn below.  The perimeter of the triangle is 34 cm. Calculate the length of s	a) A regular dodecagon has a perimeter of 48 mm. Calculate the length of one side of the dodecagon. b) An isosceles triangle is drawn below.  The perimeter of the triangle is 59 m. Calculate the length of x

Worked Example

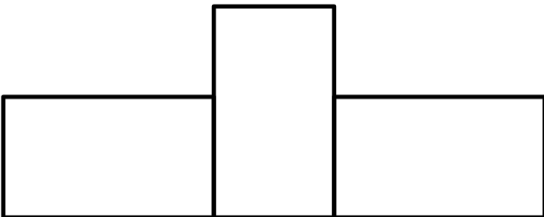
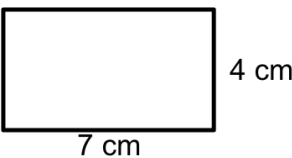
Here is a rectangle.



This rectangle is used several times to make the shape above. Work out the perimeter of the shape.

Your Turn

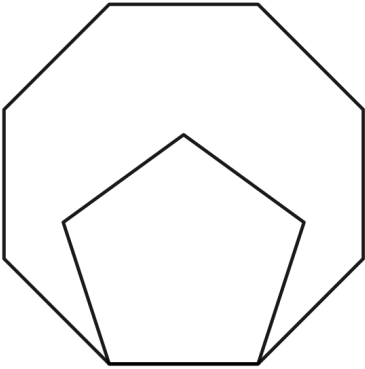
Here is a rectangle.



This rectangle is used several times to make the shape above. Calculate the perimeter of the shape.

Worked Example

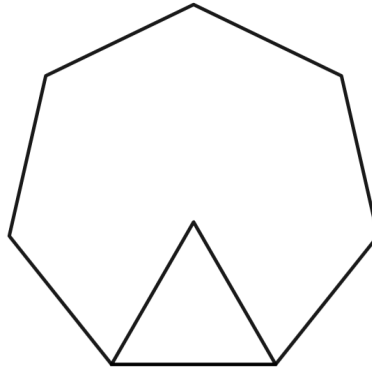
A regular pentagon is drawn inside of a regular octagon, as shown below. The perimeter of the regular pentagon is 50 mm.



Calculate the perimeter of the regular octagon.

Your Turn

An equilateral triangle is drawn inside of a regular heptagon, as shown below. The perimeter of the equilateral triangle is 12 cm.

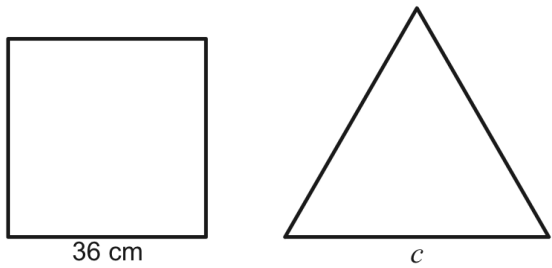


Calculate the perimeter of the regular heptagon.

[illegible]

Worked Example

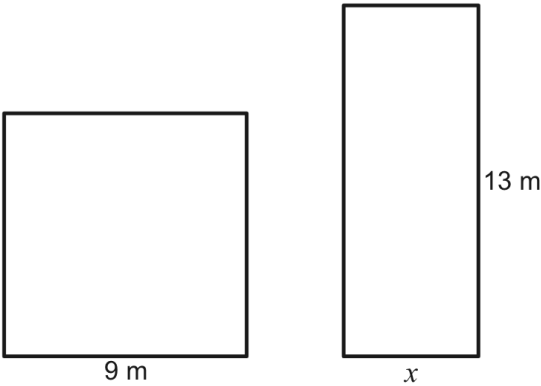
The diagram below shows a square and an equilateral triangle.



The perimeter of the square is equal to the perimeter of the equilateral triangle. Calculate the length of c

Your Turn

The diagram below shows a square and a rectangle.



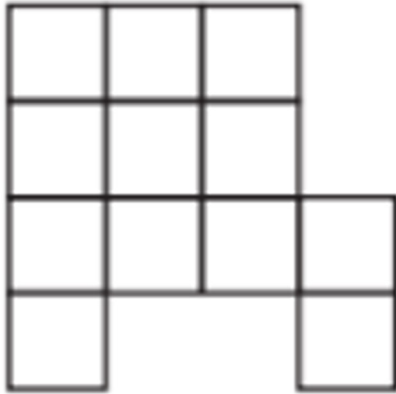
The perimeter of the square is equal to the perimeter of the rectangle. Calculate the length of x

4.3 Area on a Grid

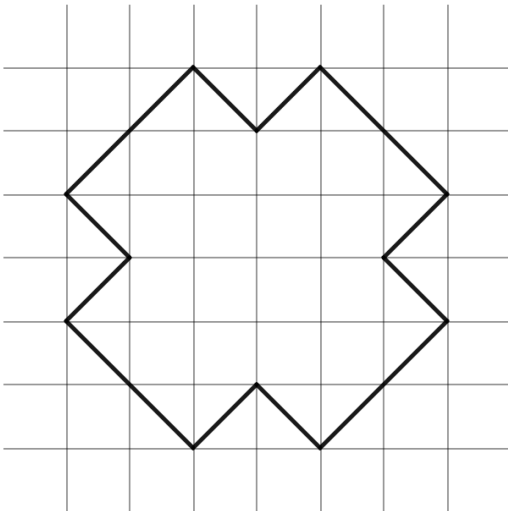
Worked Example

Calculate the area of the shapes below:

a)



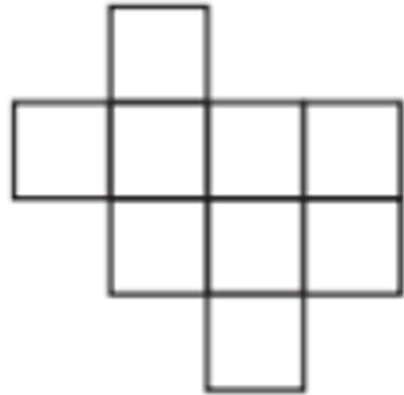
b)



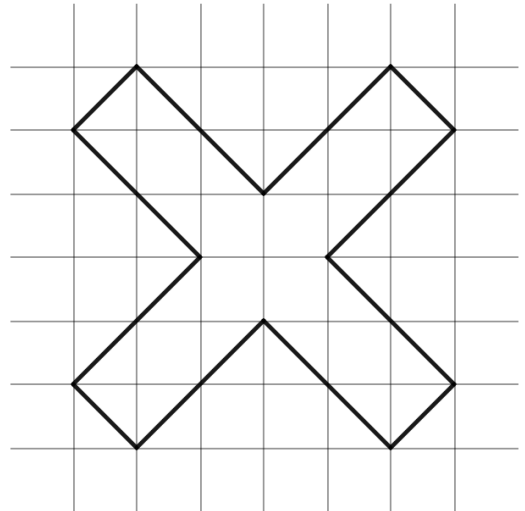
Your Turn

Calculate the area of the shapes below:

a)



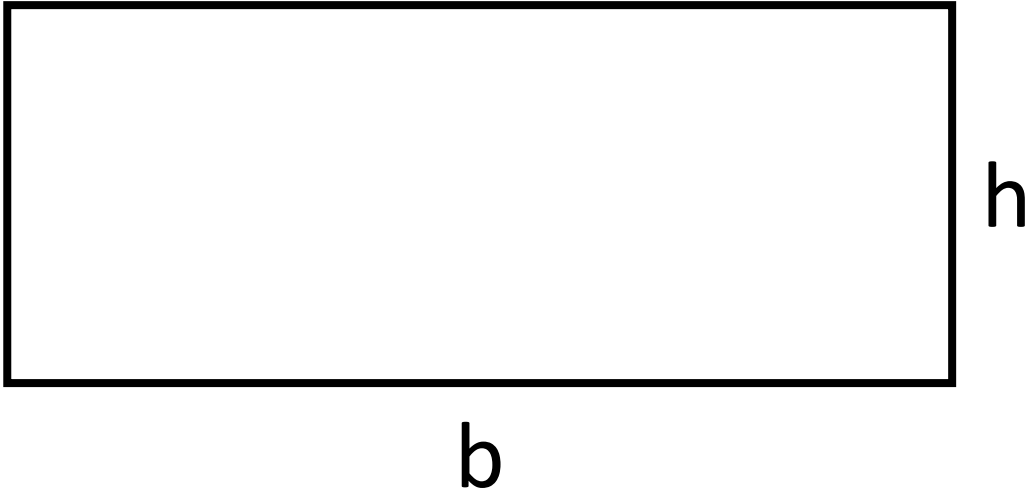
b)

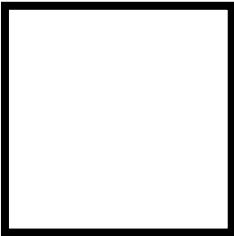
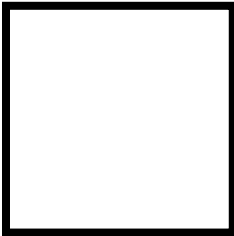


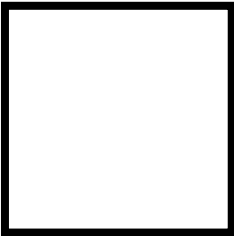
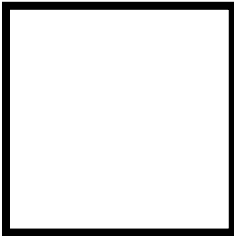
4.4 Area of Rectangles

Area = base x height

$$A = b \times h$$

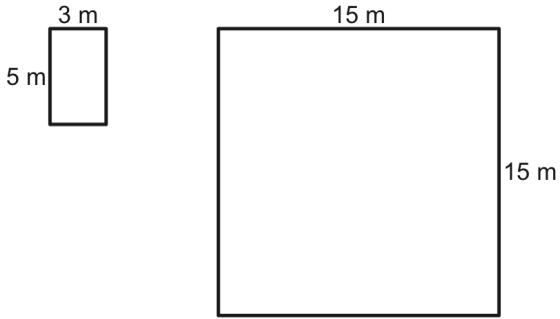


Worked Example	Your Turn
a) Calculate the area of the rectangle: 6cm  2cm b) Calculate the area of the square: 3cm 	a) Calculate the area of the rectangle: 12cm  4cm b) Calculate the area of the square: 6cm 

Worked Example	Your Turn
a) Calculate x if the area of the rectangle is 12cm^2: 6cm  $x\text{cm}$ b) Calculate x if the area of the square is 9cm^2: $x\text{cm}$ 	a) Calculate x if the area of the rectangle is 48cm^2: 12cm  $x\text{cm}$ b) Calculate x if the area of the square is 36cm^2: $x\text{cm}$ 

Worked Example

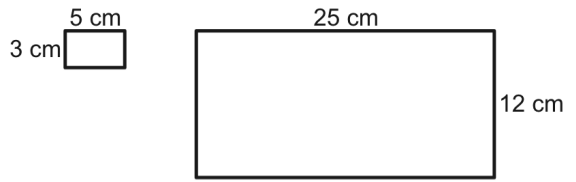
A rectangle and a square are shown in the diagram below.



Find how many small rectangles can fit inside the large square. The small rectangles must not overlap and there must be no space left.

Your Turn

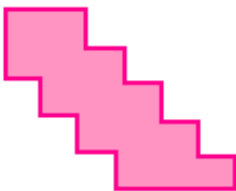
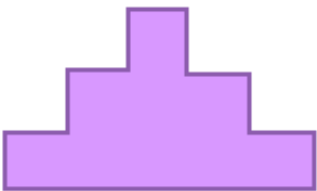
Two rectangles are shown in the diagram below.



Find how many small rectangles can fit inside the large rectangle. The small rectangles must not overlap and there must be no space left.

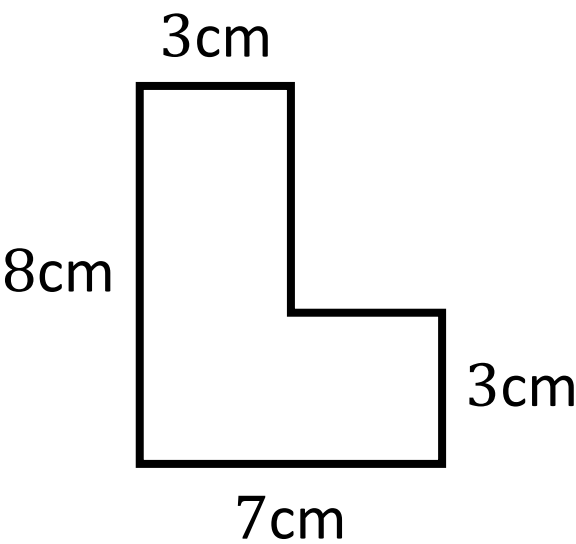
4.5 Area of Rectilinear Shapes

A rectilinear shape is one whose edges all meet at right angles.



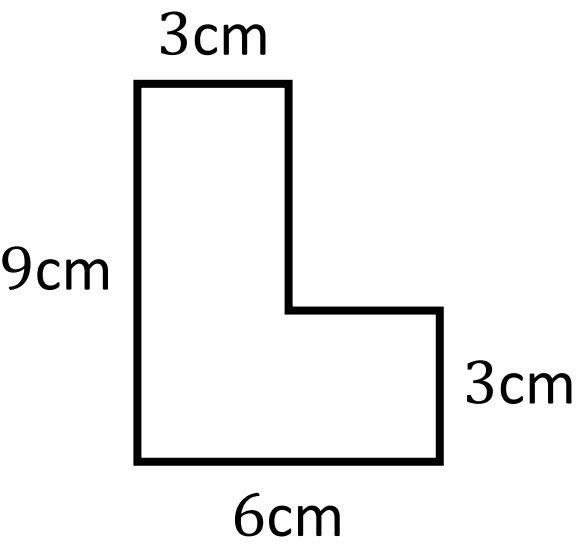
Worked Example

Calculate the area of the shape below:



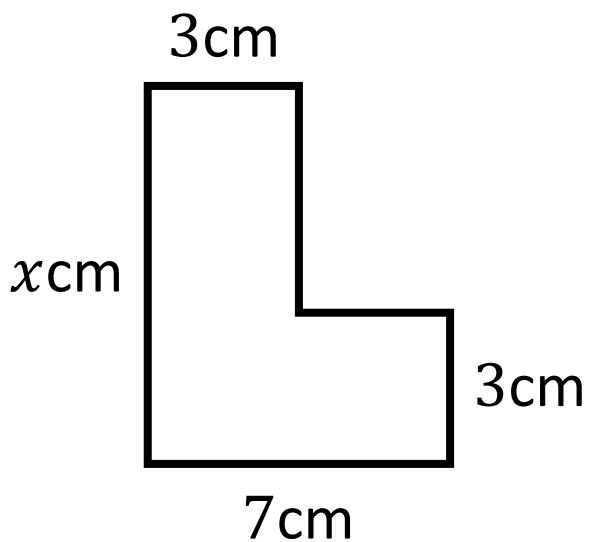
Your Turn

Calculate the area of the shape below:



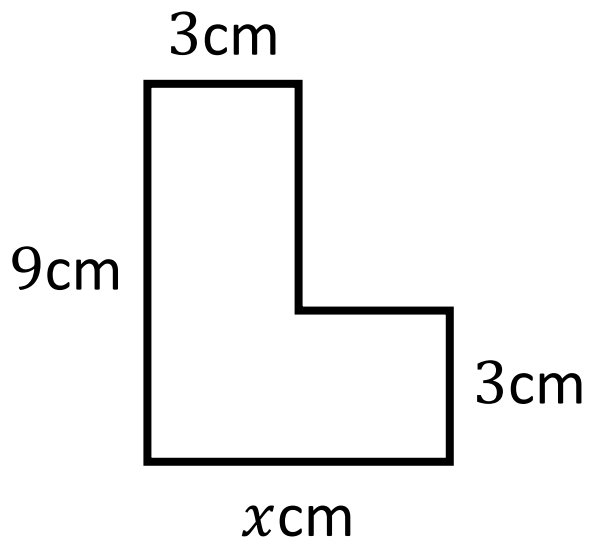
Worked Example

The area of the shape below is 36 cm^2 . Find x .



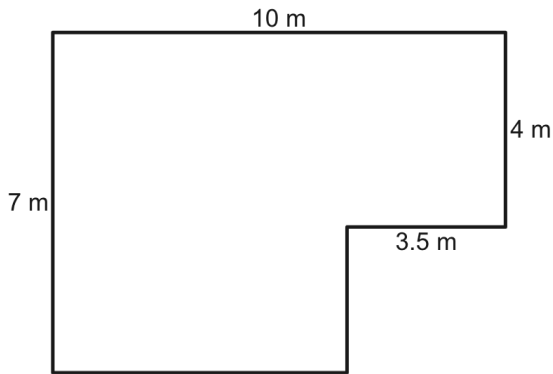
Your Turn

The area of the shape below is 36 cm^2 . Find x .



Worked Example

The diagram shows the plan of a garden.



Tulia covers the garden with square tiles of side length 50 cm. There are no gaps between the tiles.

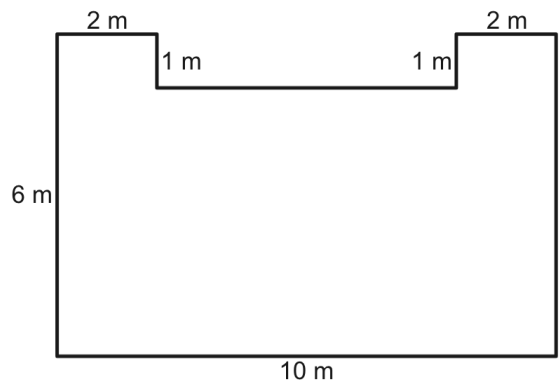
It takes 3 minutes to lay each tile.

Work out how long it takes Tulia to cover the whole garden with tiles. Give your answer in hours and minutes.

[illegible]

Your Turn

The diagram shows the plan of a garden.



Lucy covers the garden with square tiles of side length 50 cm. There are no gaps between the tiles.

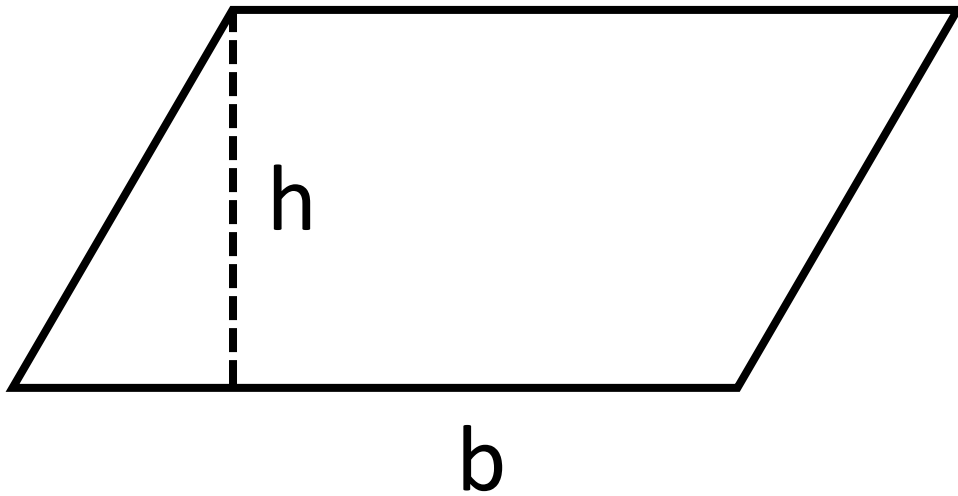
It takes 2 minutes to lay each tile.

Work out how long it takes Lucy to cover the whole garden with tiles. Give your answer in hours and minutes.

4.6 Area of Parallelograms

Area of a parallelogram = base x perpendicular height

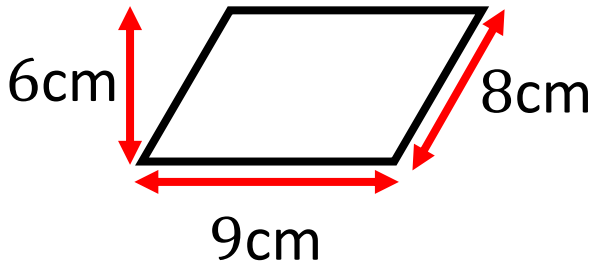
$$A = b \times h$$



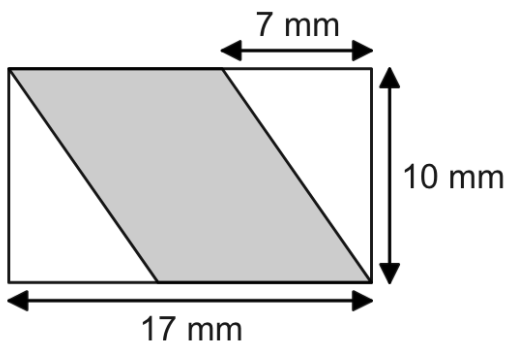
Worked Example

Calculate the area of the parallelograms below:

a)



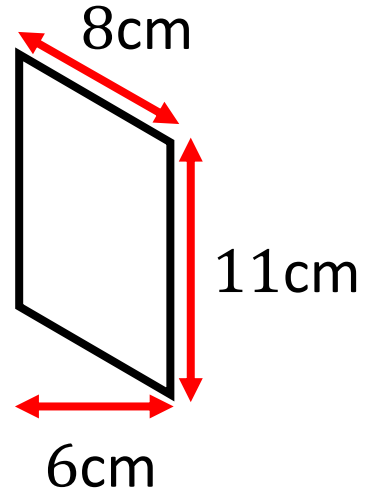
b)



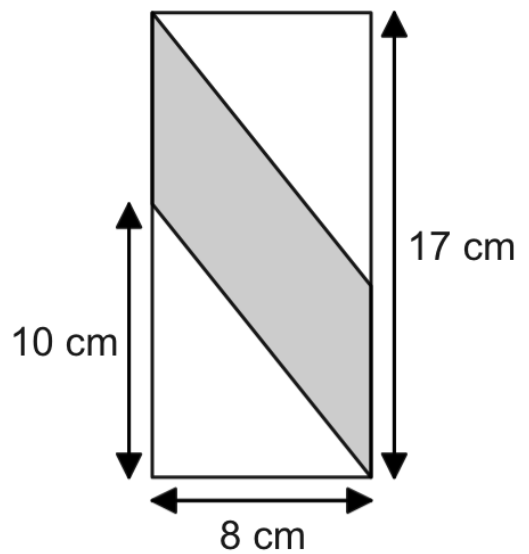
Your Turn

Calculate the area of the parallelograms below:

a)

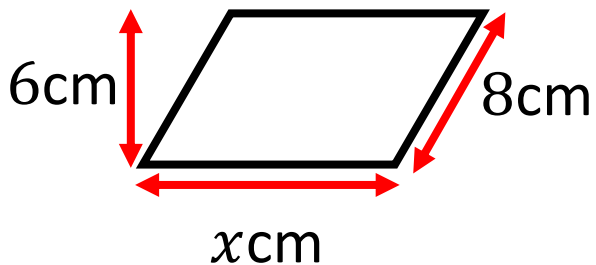


b)



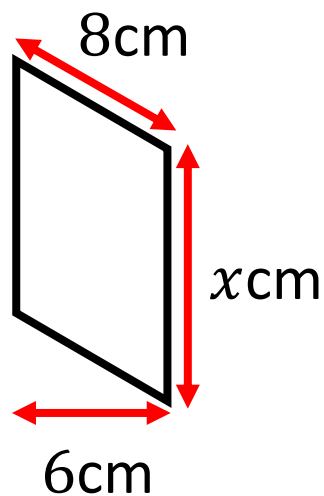
Worked Example

Calculate x if the area of the parallelogram is 54cm^2 :



Your Turn

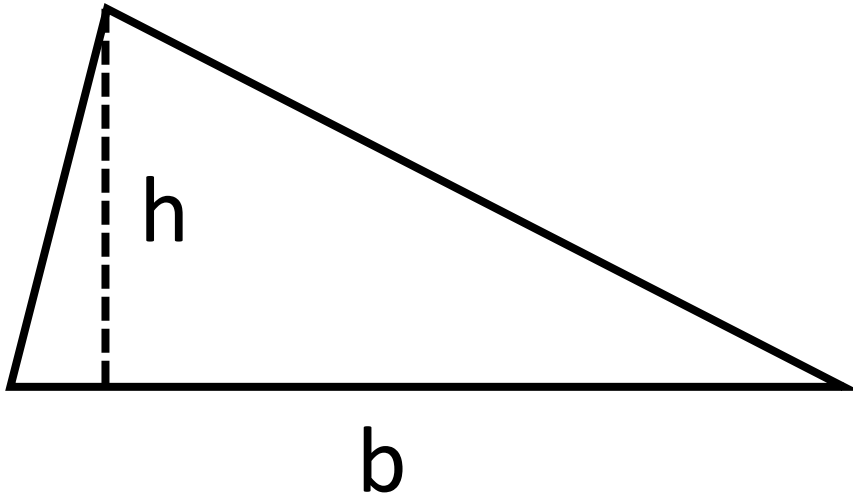
Calculate x if the area of the parallelogram is 66cm^2 :



4.7 Area of Triangles

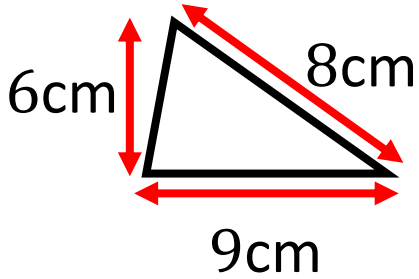
Area of a triangle = $\frac{\text{base} \times \text{perpendicular height}}{2}$

$$A = \frac{b \times h}{2}$$



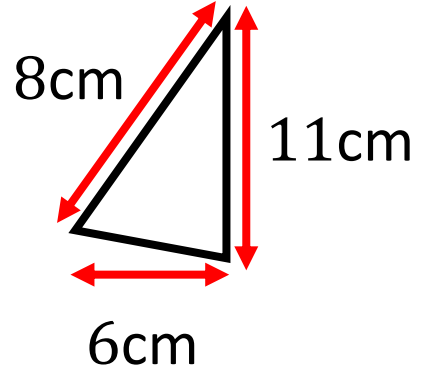
Worked Example

Calculate the area of the triangle:



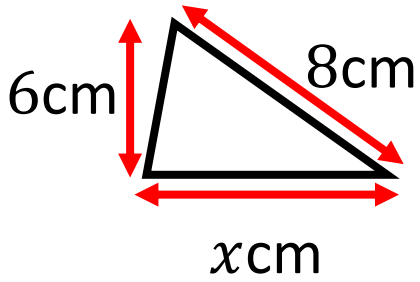
Your Turn

Calculate the area of the triangle:



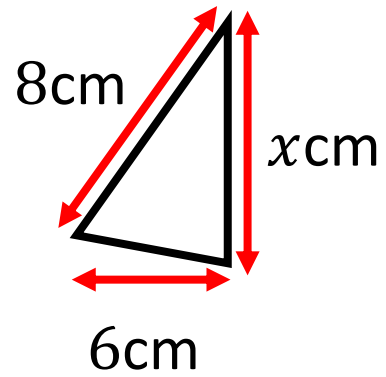
Worked Example

Calculate x if the area of the triangle is 27cm^2 :



Your Turn

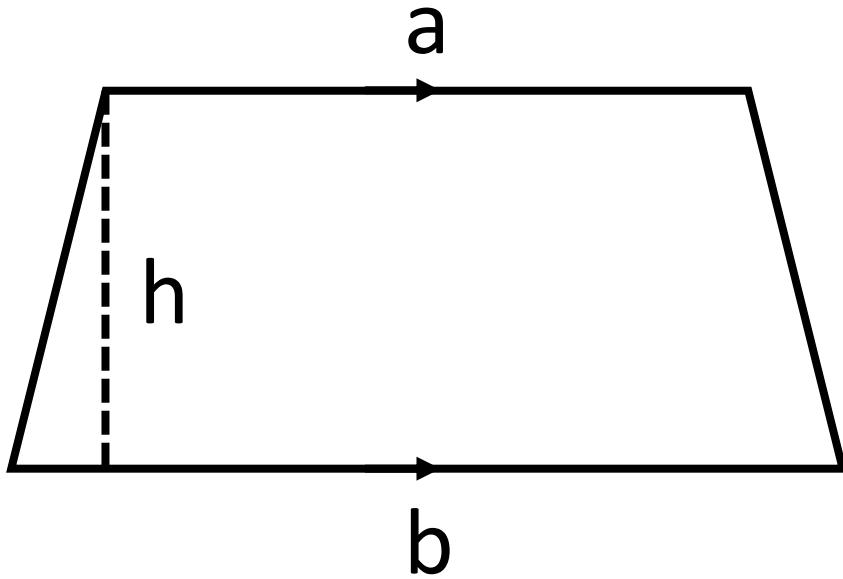
Calculate x if the area of the triangle is 33cm^2 :



4.8 Area of Trapeziums

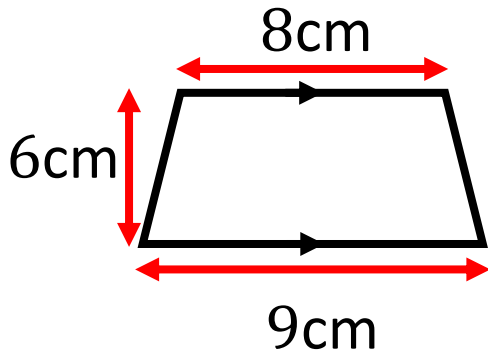
Area of a trapezium = $\frac{\text{sum of parallel sides}}{2}$ x perpendicular height

$$A = \frac{a+b}{2} \times h$$



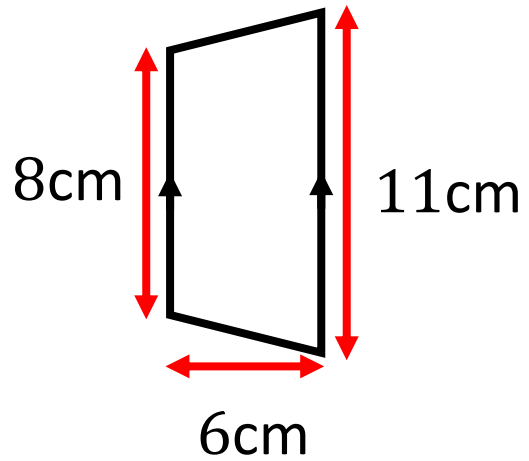
Worked Example

Calculate the area of the trapezium:



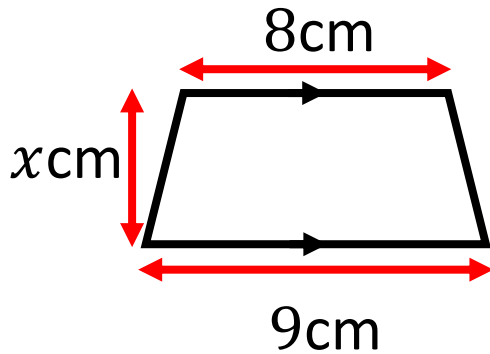
Your Turn

Calculate the area of the trapezium:



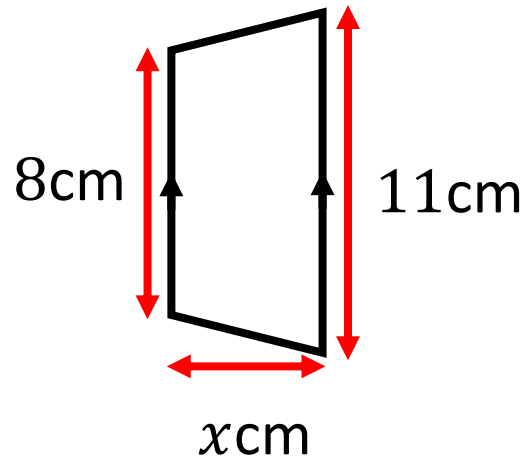
Worked Example

Calculate x if the area of the trapezium is 51cm^2 :



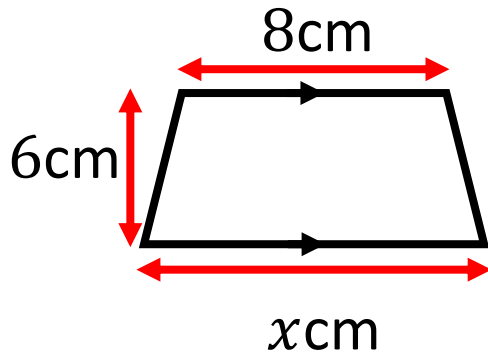
Your Turn

Calculate x if the area of the trapezium is 57cm^2 :



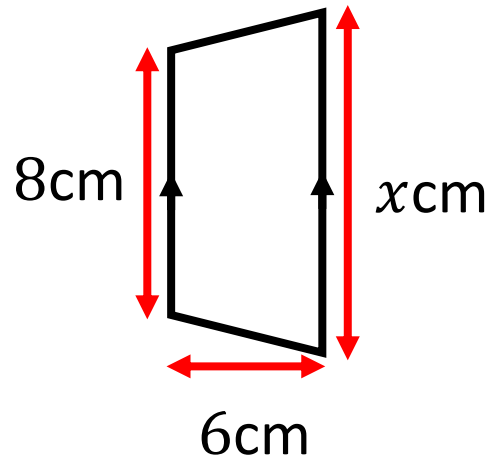
Worked Example

Calculate x if the area of the trapezium is 51cm^2 :



Your Turn

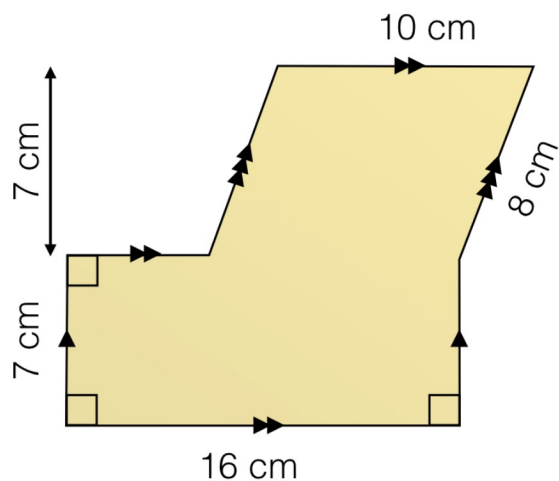
Calculate x if the area of the trapezium is 57cm^2 :



4.9 Area of Compound Shapes without Circles

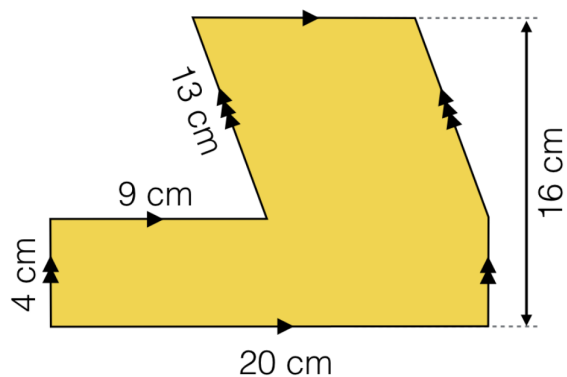
Worked Example

Calculate the area of the compound shape:



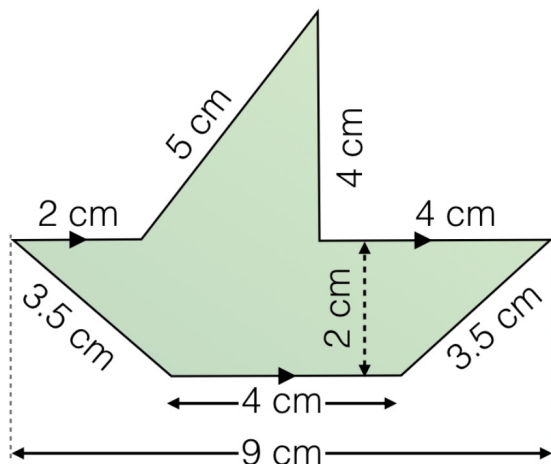
Your Turn

Calculate the area of the compound shape:



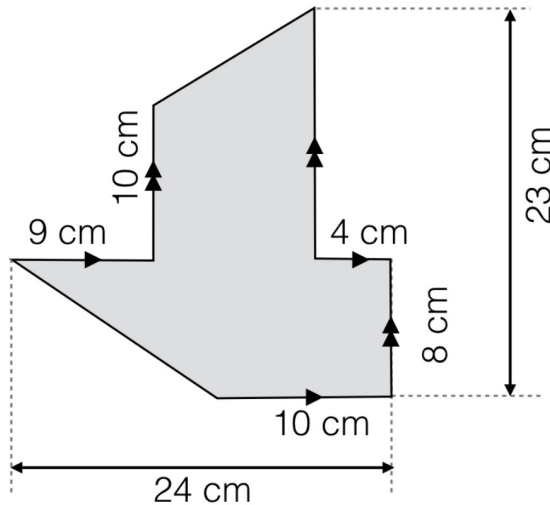
Worked Example

Calculate the area of the compound shape:



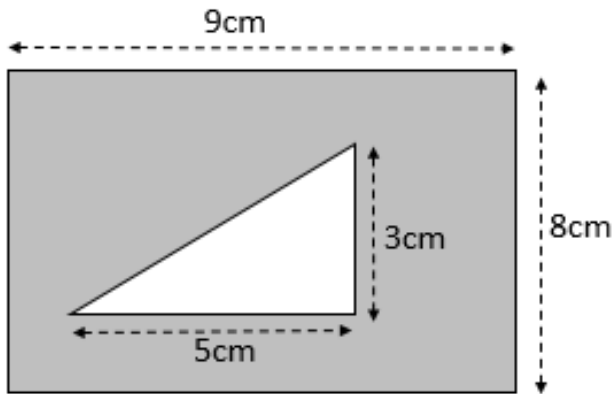
Your Turn

Calculate the area of the compound shape:



Worked Example

Calculate the area of the shaded shape:



Your Turn

Calculate the area of the shaded shape:

