KING EDWARD VI
HANDSWORTH GRAMMAR
SCHOOL FOR BOYS

KING EDWARD VI
ACADEMY TRUST
BIRMINGHAM

Year 7
2025 Mathematics 2026
Unit 4 Booklet

HGS Maths

Tasks

Dr Frost Course

Name: _____

Class: _____

Contents

1 Rounding

1.1 Rounding to the Nearest Multiple

Worked Example	Your Turn
Round 63 to the nearest: a) 10 b) 2 c) 3	Round 65 to the nearest: a) 10 b) 2 c) 3

Worked Example	Your Turn
Round $56{,}789$ to the nearest: a) 10 b) 100 c) $1{,}000$ d) $10{,}000$	Round $987{,}654$ to the nearest: a) 10 b) 100 c) $1{,}000$ d) $100{,}000$

Dr Frost 37a, 37b, 37c and 37d

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

Worked Example	Your Turn
Round 0.0337 to: a) 1 decimal place b) 2 decimal places c) 3 decimal places d) Nearest Integer	Round 0.0377 to: a) 1 decimal place b) 2 decimal places c) 3 decimal places d) Nearest Integer

Worked Example	Your Turn
Round 8.7997 to: a) 1 decimal place b) 2 decimal places c) 3 decimal places d) Nearest Integer	Round 7.8998 to: a) 1 decimal place b) 2 decimal places c) 3 decimal places d) Nearest Integer

Dr Frost 75b, 75c and 75a

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 =

Worked Example	Your Turn
Round 271828 to: a) 1 significant figure b) 2 significant figures c) 3 significant figures	Round 738906 to: a) 1 significant figure b) 2 significant figures c) 3 significant figures

Dr Frost 187c and 187e

Worked Example	Your Turn
Round 2.71828 to: a) 1 significant figure b) 2 significant figures c) 3 significant figures	Round 7.38906 to: a) 1 significant figure b) 2 significant figures c) 3 significant figures

Worked Example	Your Turn
Round 0.00271828 to: a) 1 significant figure b) 2 significant figures c) 3 significant figures	Round 0.00738906 to: a) 1 significant figure b) 2 significant figures c) 3 significant figures

Worked Example	Your Turn
Round 0.00279999 to: a) 1 significant figure b) 2 significant figures c) 3 significant figures	Round 0.00739999 to: a) 1 significant figure b) 2 significant figures c) 3 significant figures

Dr Frost 187d and 187f

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?
Distance		
Millimetres (mm)		
Centimetres (cm)		
Metres (m)		
Kilometres (km)		
Weight		
Grams (g)		
Kilograms (kg)		
Tonnes (T)		
Capacity		
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)

Worked Example	Your Turn
Convert 21.1 centimetres into: a) kilometres b) metres c) millimetres	Convert 3.17 centimetres into: a) kilometres b) metres c) millimetres

2.2 Metric Units of Mass

The commonly used metric units of mass include:

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

Worked Example	Your Turn
Convert 21.1 kilograms into: a) grams b) tonnes	Convert 3.17 kilograms into: a) grams b) tonnes

Dr Frost 107d and 107e

2.3 Metric Units of Capacity

The commonly used metric units of capacity include:

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

Worked Example	Your Turn
Convert 21.1 centilitres into: a) millilitres b) litres	Convert 3.17 centilitres into: a) millilitres b) litres

Dr Frost 107f and 107g

Worked Example	Your Turn
a) In a long-jump competition, Sam jumped 220 centimetres. Freddy jumped 4.6 metres. Calculate how far they have jumped altogether. Give your answer in centimetres.	a) In a long-jump competition, Tom jumped 490 centimetres. George jumped 3.8 metres. Calculate how far they have jumped altogether. Give your answer in metres.
b) A bag of flour weighs 400 g, and a second bag weighs 0.7 kg. What is the total mass of the two bags combined? Give your answer in kg.	b) A large water bottle can hold 0.8 litre, while a small one holds 200 ml. How much more capacity does the large bottle have compared to the small one? Give your answer in ml.

2.4 Metric Units of Time

The commonly used metric units of time include:

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

Worked Example	Your Turn
a) Sam play cards for 7 hours and 42 minutes. Write this duration in minutes. b) Luke play cards for 521 minutes. Write this duration in hours and minutes.	a) Lacey play cards for 8 hours and 37 minutes. Write this duration in minutes. b) Ellie play cards for 414 minutes. Write this duration in hours and minutes.

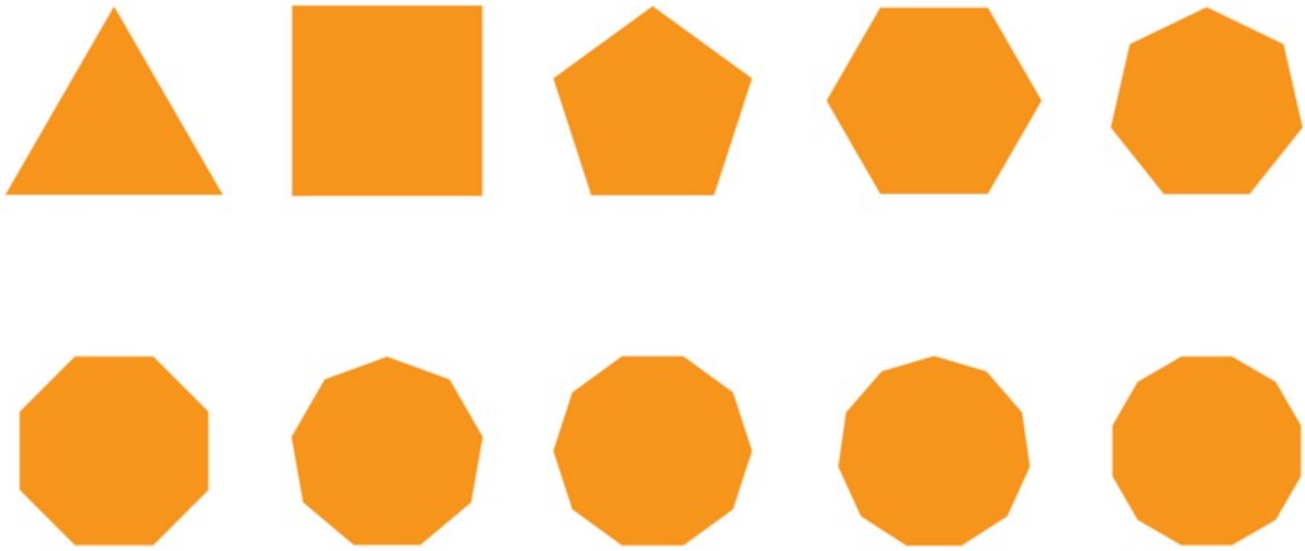
Dr Frost 59b and 59g

Worked Example	Your Turn
a) Lorrie eats for 12 minutes and 19 seconds. Write this duration in seconds. b) Lily eats for 504 seconds. Write this duration in minutes.	a) Latika eats for 6 minutes and 28 seconds. Write this duration in seconds. b) Mike eats for 374 seconds. Write this duration in minutes.

Dr Frost 59c and 59h

3 Properties of 2D Shapes

3.1 Names of 2D Shapes



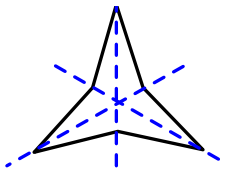
3.2 Line Symmetry

Fluency Practice

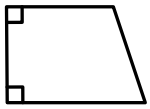
learn by heart

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.



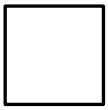
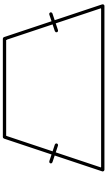
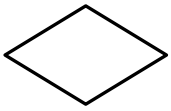
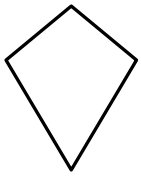
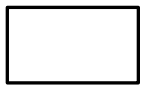
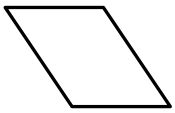
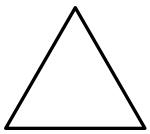
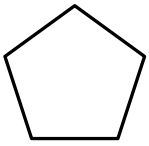
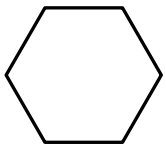
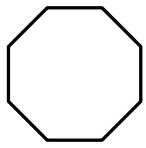
This shape has **3** lines of symmetry.



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

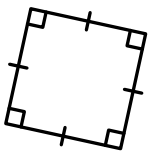
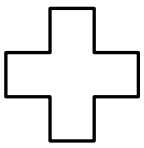
exercise 3d

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	Equaliteral 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

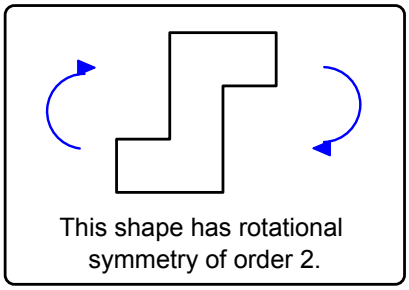
3.3 Rotational Symmetry

Fluency Practice

learn by heart

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

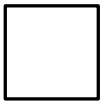
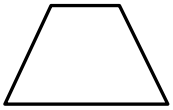
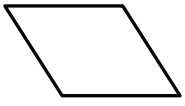
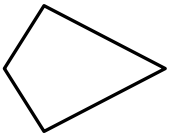
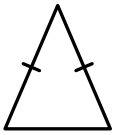
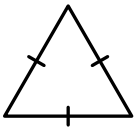
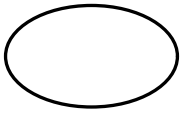
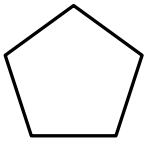
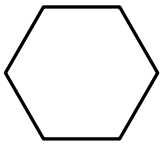
A shape's **order of rotational symmetry** is the number of times it looks the same in a full turn.



This shape has rotational symmetry of order 2.

exercise 3f

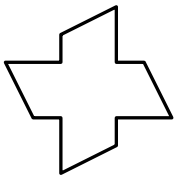
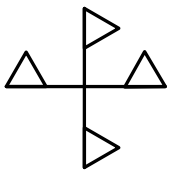
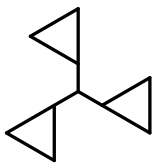
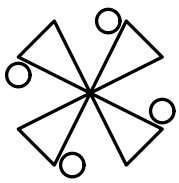
1. State the order of rotational symmetry of each shape, or write 'none' if the shape has no rotational symmetry.

				
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.

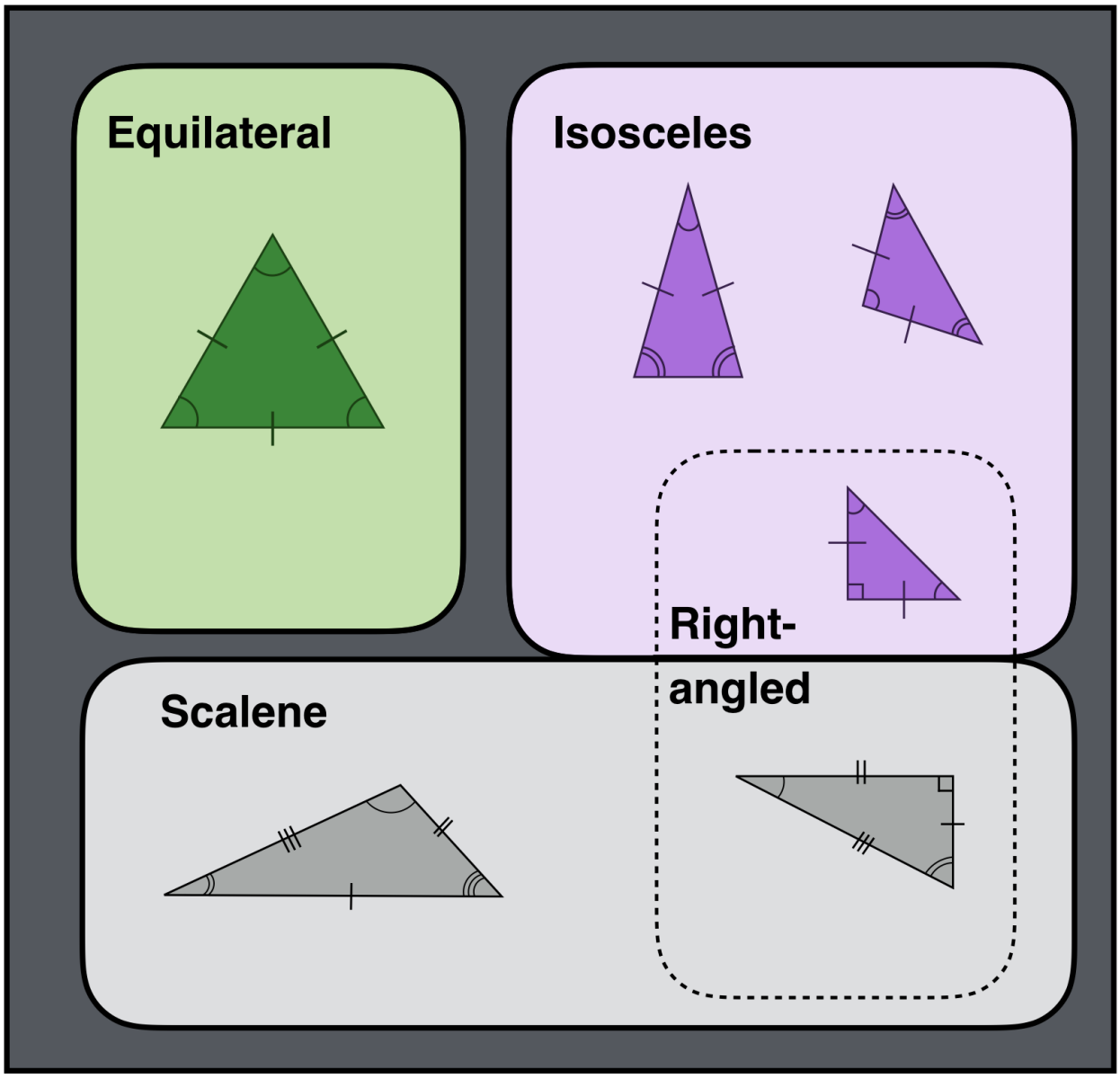
				

5. D E G H I M N S U W X Z

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

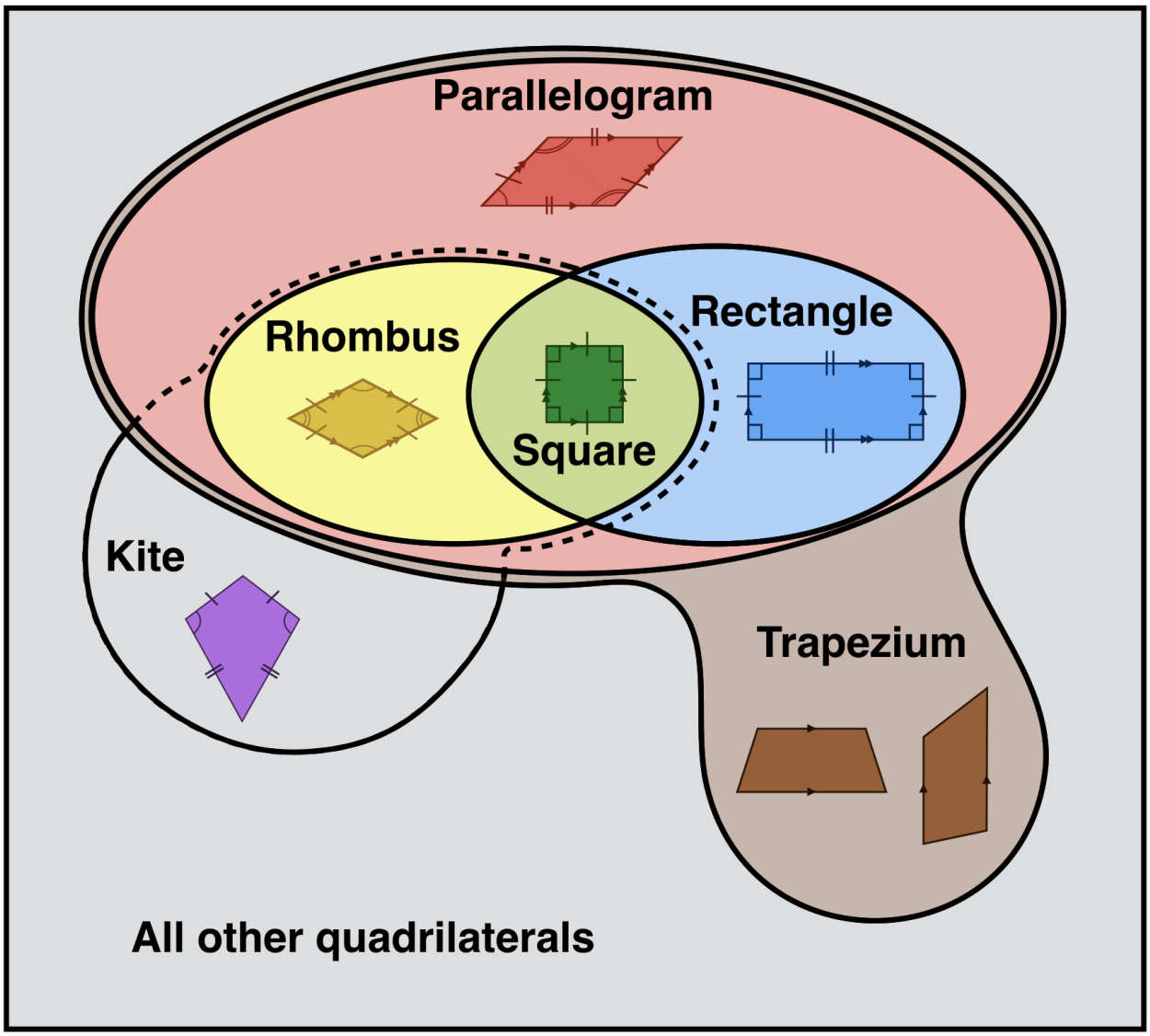


Types and Properties of Triangles

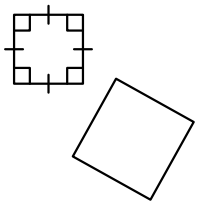
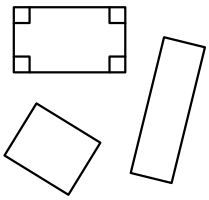
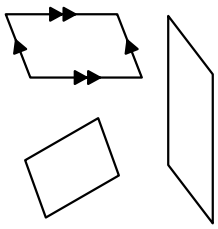
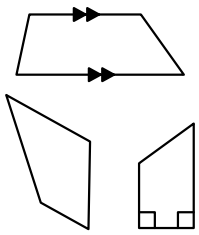
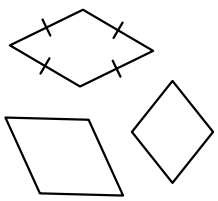
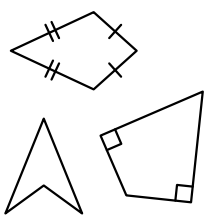
Name	Examples	Properties
Equilateral		
Isosceles		
Scalene		
Right-Angled		

Dr Frost 77a and 78e

3.5 Types and Properties of Quadrilaterals



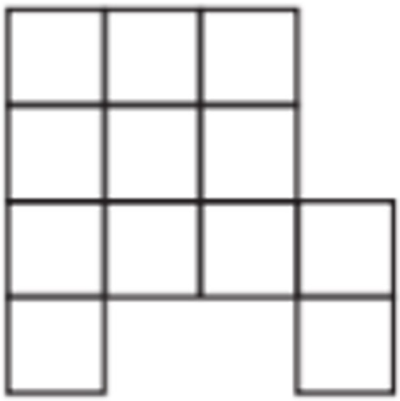
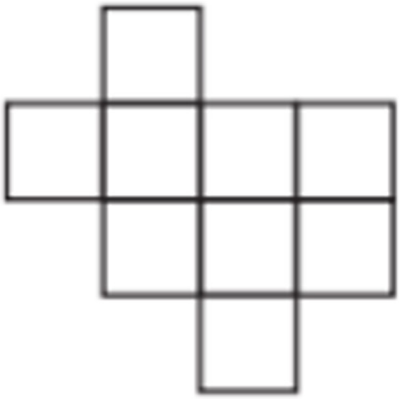
Types and Properties of Quadrilaterals

Name	Examples	Properties	Diagonals
Square			
Rectangle			
Parallelogram			
Trapezium			
Rhombus			
Kite			

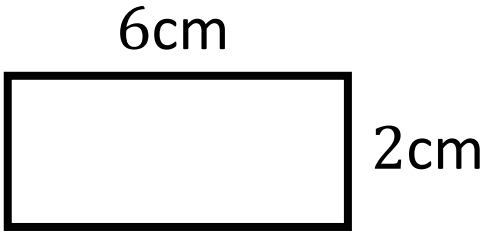
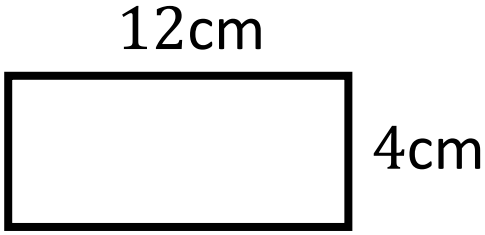
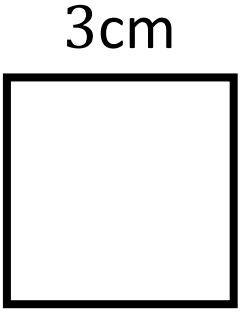
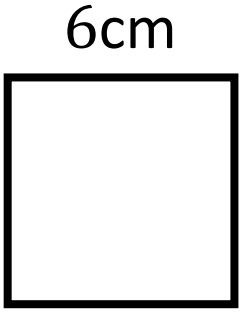
Dr Frost 77b and 78f

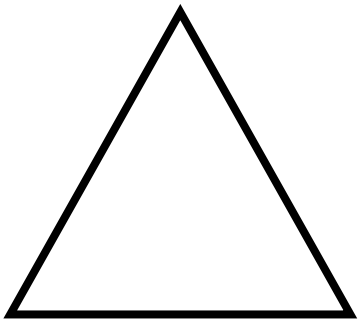
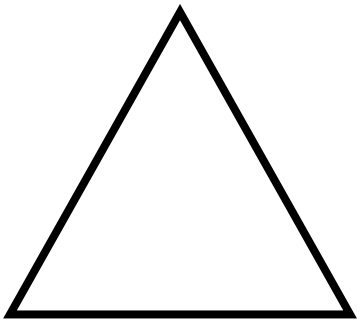
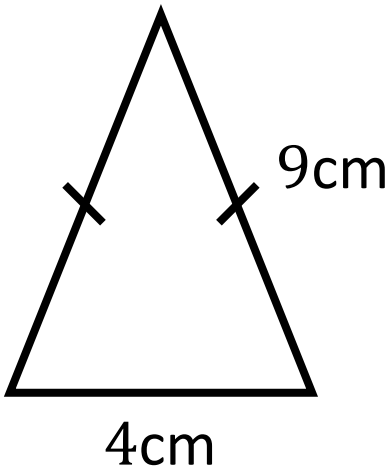
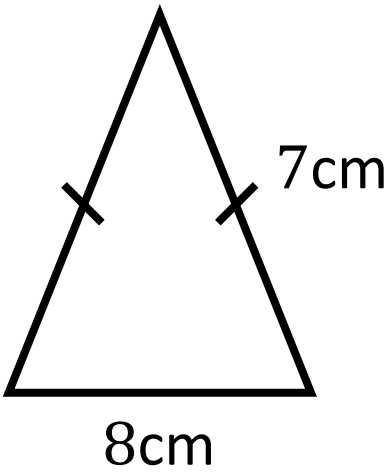
4 Area and Perimeter

4.1 Perimeter on a Grid

Worked Example	Your Turn
Calculate the perimeter of the shape below: 	Calculate the perimeter of the shape below: 

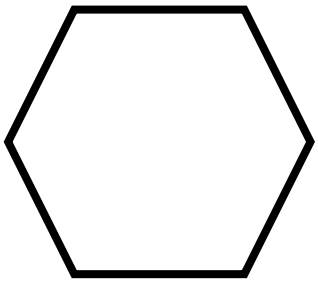
4.2 Perimeter

Worked Example	Your Turn
a) Calculate the perimeter of the rectangle:  	a) Calculate the perimeter of the rectangle: 
b) Calculate the perimeter of the square:  	b) Calculate the perimeter of the square: 

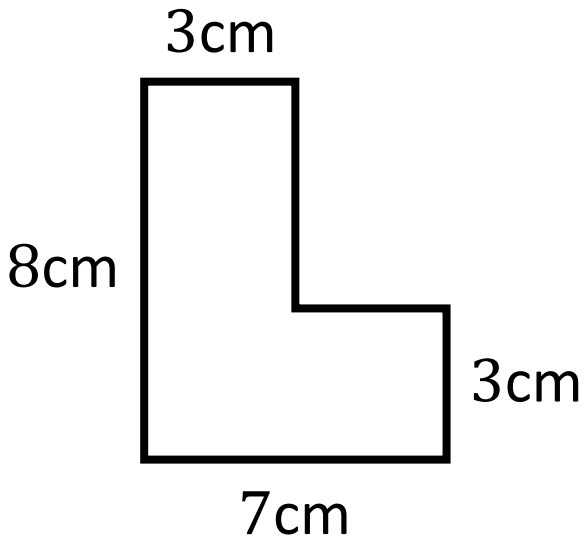
Worked Example	Your Turn
a) Calculate the perimeter of the equilateral triangle:  	a) Calculate the perimeter of the equilateral triangle: 
b) Calculate the perimeter of the isosceles triangle:  	b) Calculate the perimeter of the isosceles triangle: 

Worked Example

a) Calculate the perimeter of the regular hexagon:

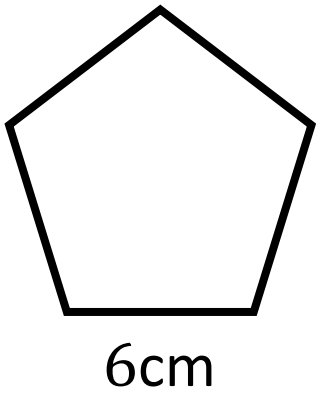


b) Calculate the perimeter of the shape below:

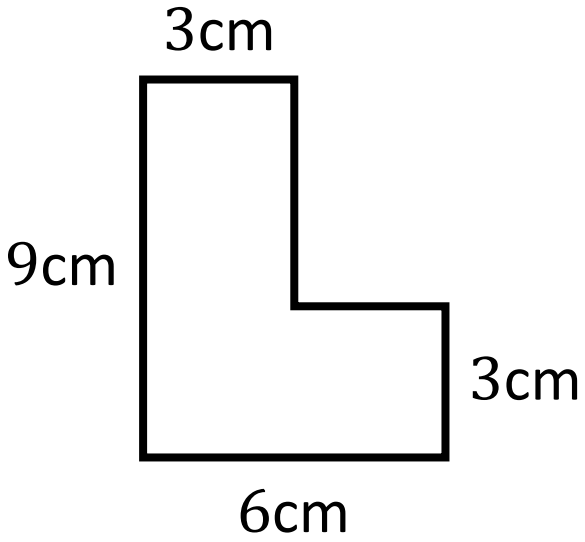


Your Turn

a) Calculate the perimeter of the regular pentagon:



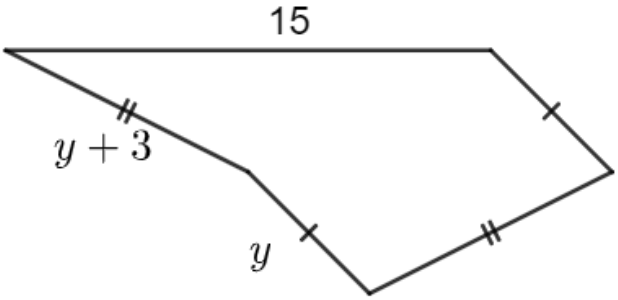
b) Calculate the perimeter of the shape below:



Dr Frost 79a, 79b and 180a

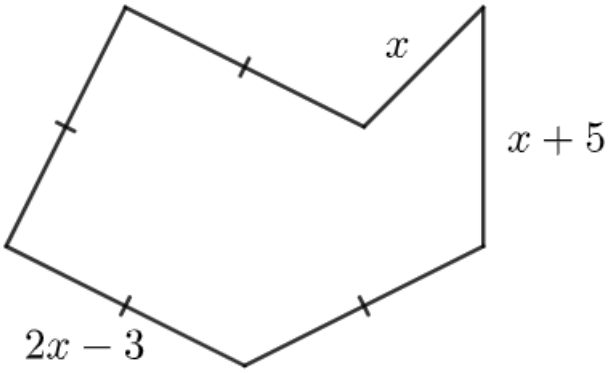
Worked Example

Find an expression for the perimeter of the following shape:



Your Turn

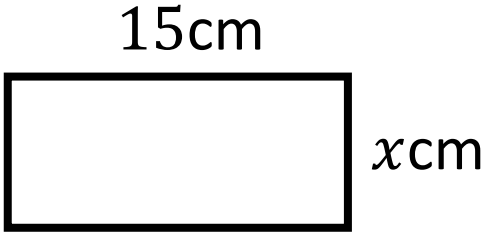
Find an expression for the perimeter of the following shape:



Dr Frost 198f

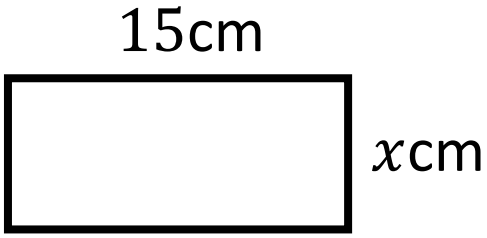
Worked Example

Calculate the length of x if the perimeter of the rectangle is 44cm:



Your Turn

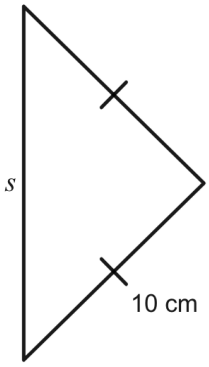
Calculate the length of x if the perimeter of the rectangle is 88cm:



Worked Example

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.

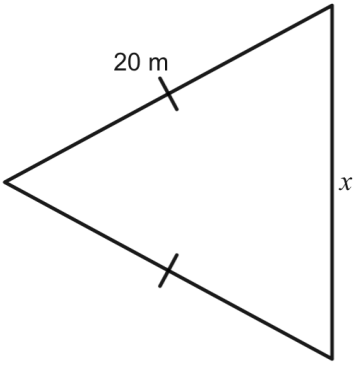


The perimeter of the triangle is 34 cm. Calculate the length of s

Your Turn

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.

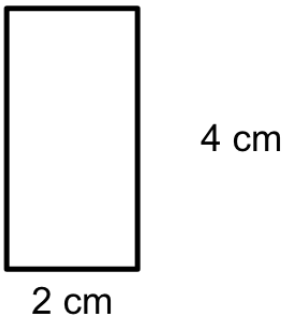


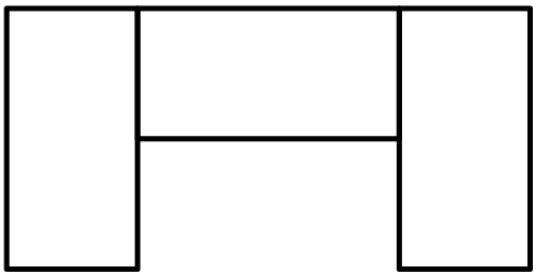
The perimeter of the triangle is 59 m. Calculate the length of x

Dr Frost 79e and 79g

Worked Example

Here is a rectangle.

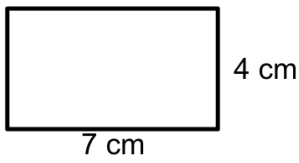


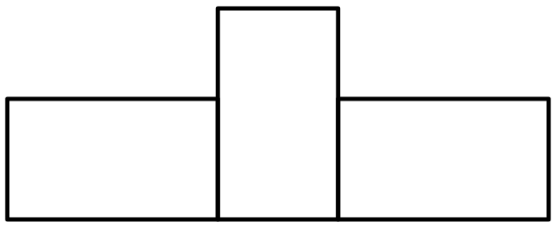


This rectangle is used several times to make the shape above.
Work out the perimeter of the shape.

Your Turn

Here is a rectangle.

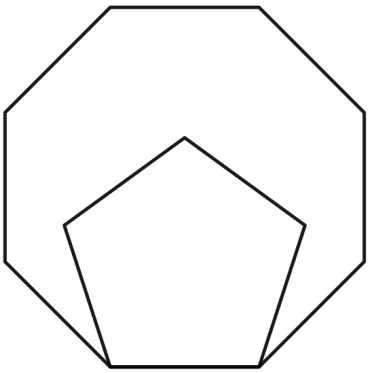




This rectangle is used several times to make the shape above.
Calculate the perimeter of the shape.

Worked Example

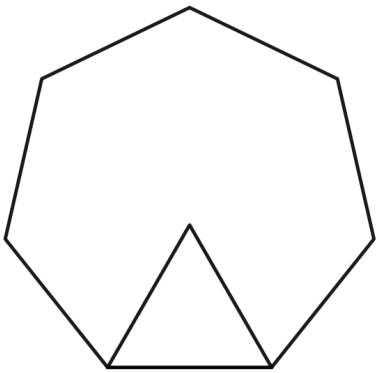
A regular pentagon is drawn inside of a regular octagon, as shown below. The perimeter of the regular pentagon is 50 mm.



Calculate the perimeter of the regular octagon.

Your Turn

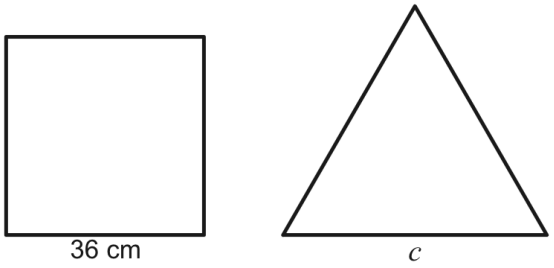
An equilateral triangle is drawn inside of a regular heptagon, as shown below. The perimeter of the equilateral triangle is 12 cm.



Calculate the perimeter of the regular heptagon.

Worked Example

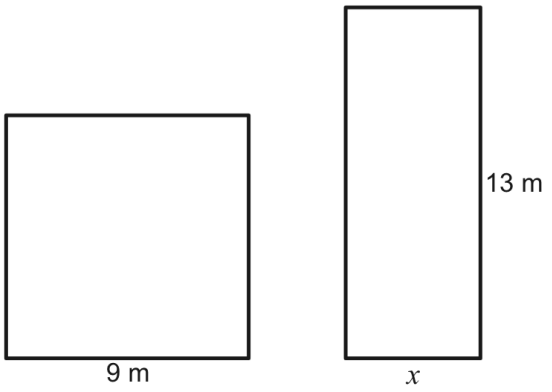
The diagram below shows a square and an equilateral triangle.



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

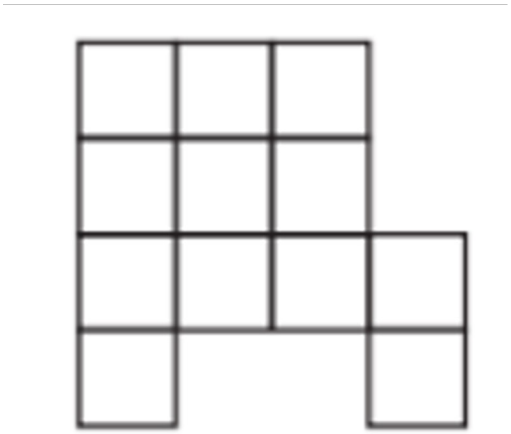
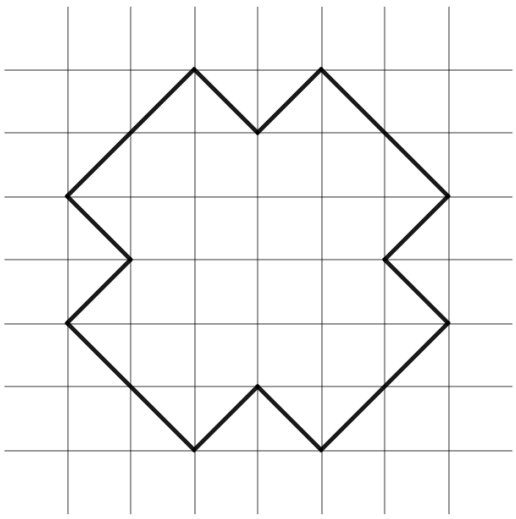
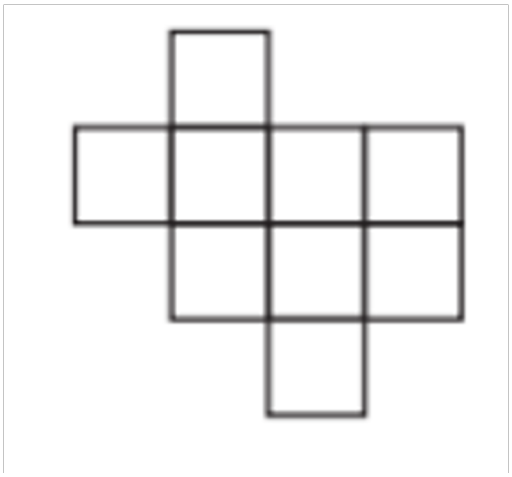
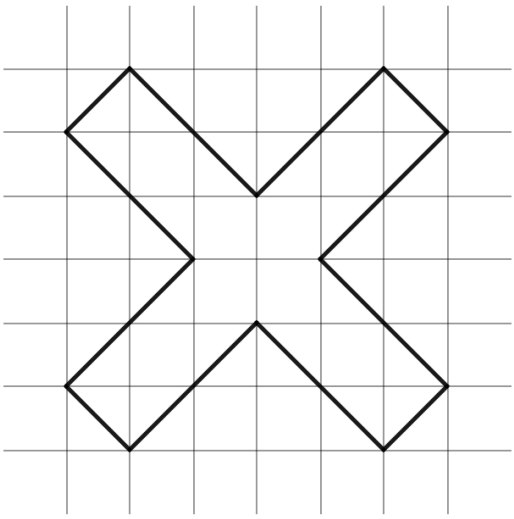
Your Turn

he 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

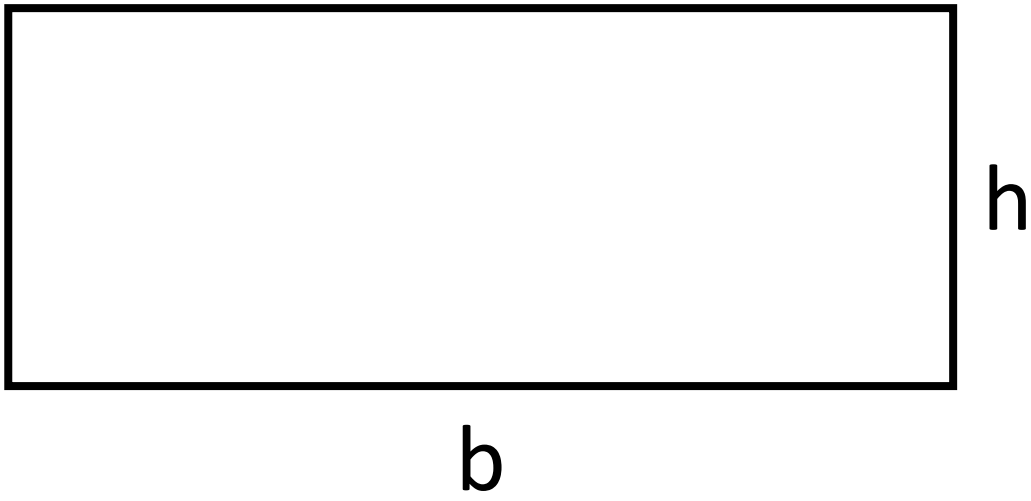
4.3 Area on a Grid

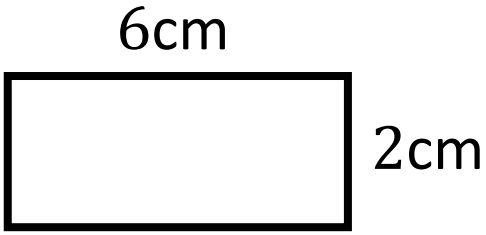
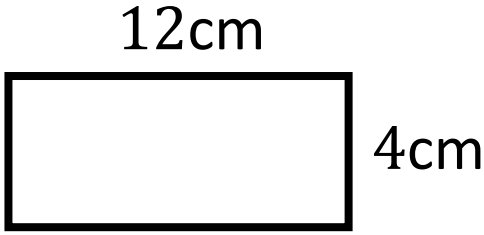
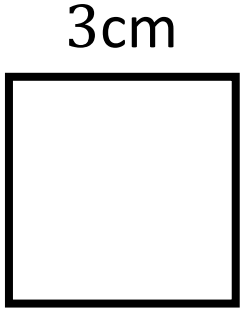
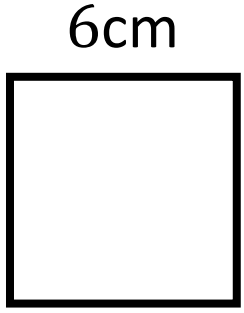
Worked Example	Your Turn
Calculate the area of the shapes below: a)  b) 	Calculate the area of the shapes below: a)  b) 

4.4 Area of Rectangles

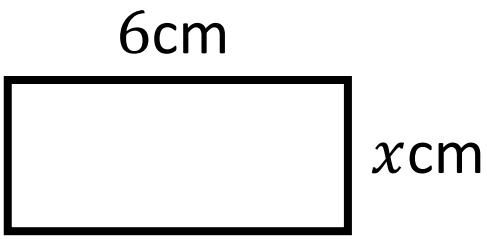
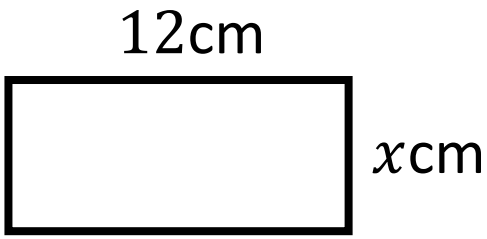
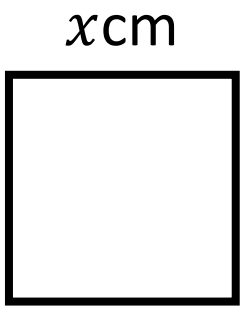
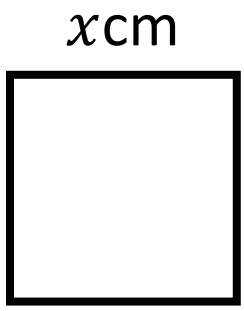
Area = base x height

$$A = b \times h$$



Worked Example	Your Turn
a) Calculate the area of the rectangle:  	a) Calculate the area of the rectangle: 
b) Calculate the area of the square:  	b) Calculate the area of the square: 

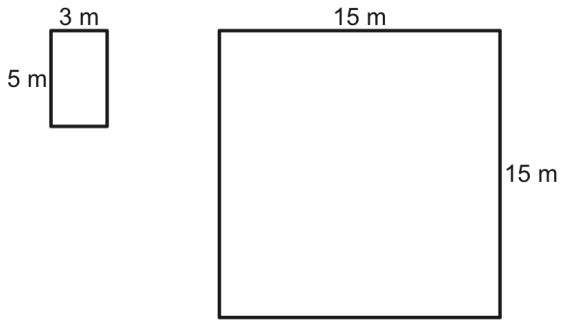
Dr Frost 138a and 138b

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

Dr Frost 138c and 138d

Worked Example

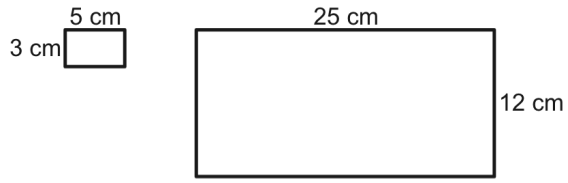
A rectangle and a square are shown in the diagram below.



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

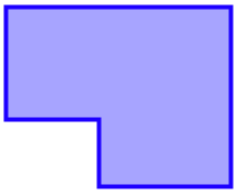
Two rectangles are shown in the diagram below.

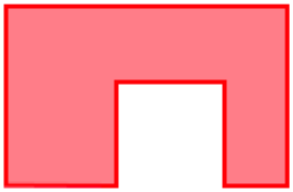
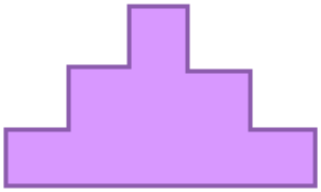
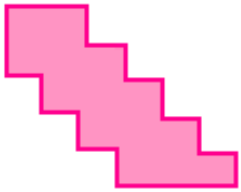


Find how many small rectangles can fit inside the large rectangle. The small rectangles must not overlap and there must be no space left.

4.5 Area of Rectilinear Shapes

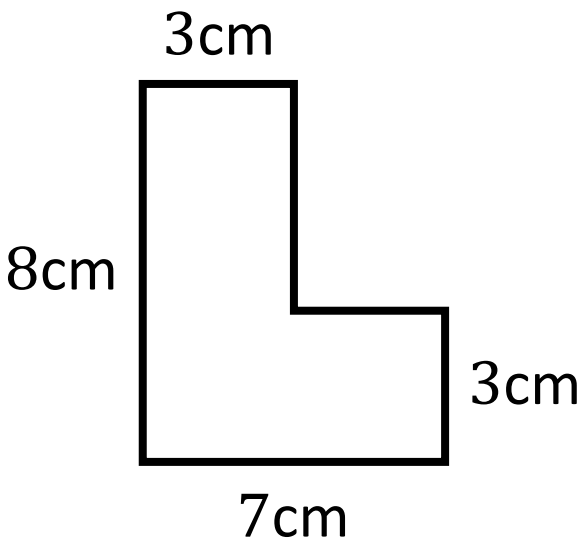
A rectilinear shape is one whose edges all meet at right angles.

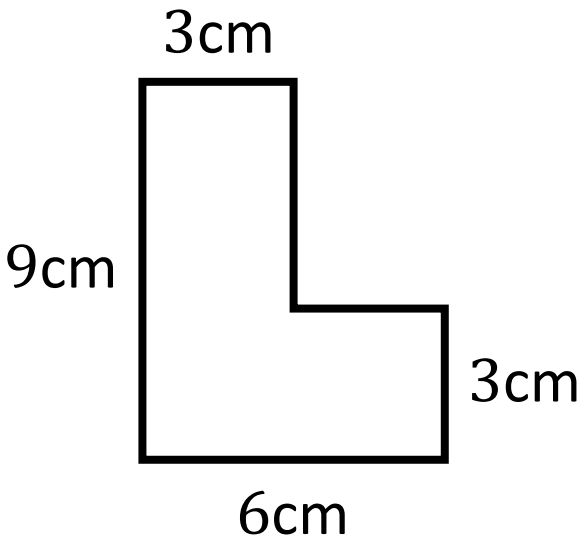
Worked Example

Calculate the area of the shape below:



Your Turn

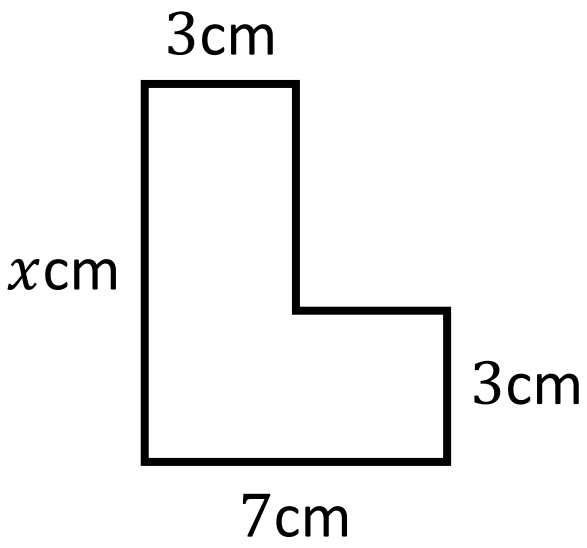
Calculate the area of the shape below:



Dr Frost 181a and 181b

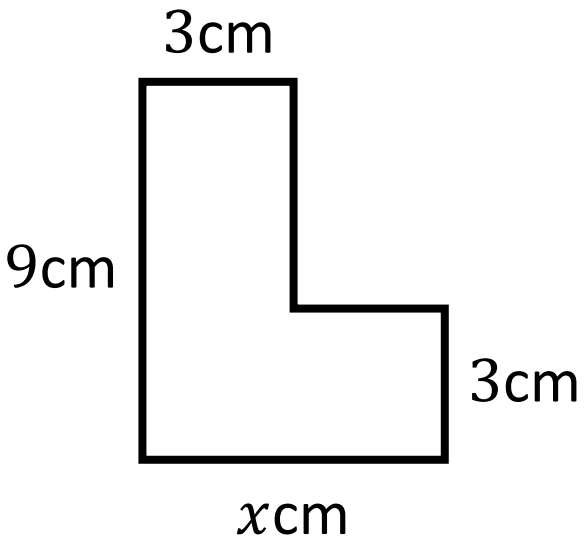
Worked Example

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



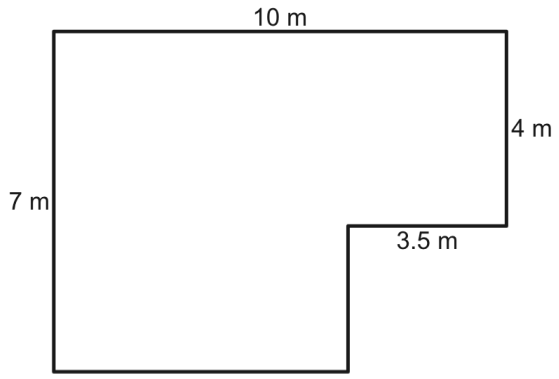
Your Turn

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



Worked Example

The diagram shows the plan of a garden.



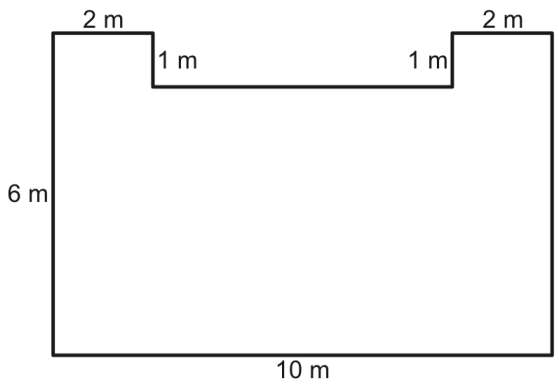
Tulia covers the garden with square tiles of side length 50 cm. There are no gaps between the tiles.

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.

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.

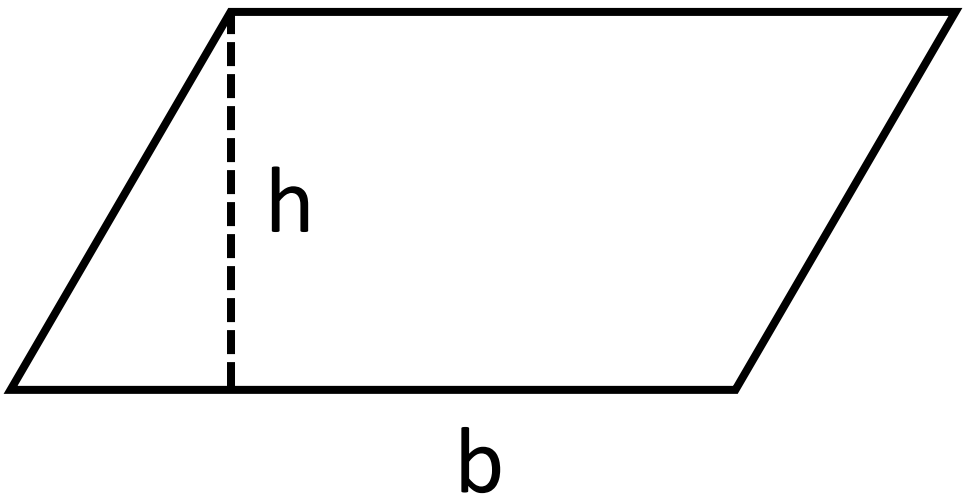
It takes 2 minutes to lay each tile.

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

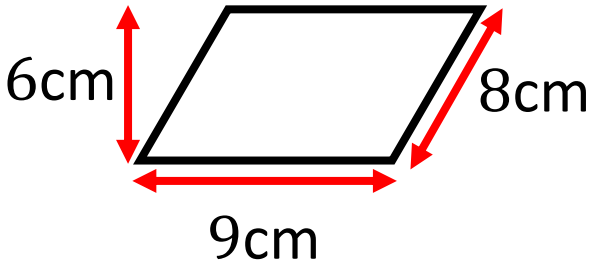
$A = b \times h$



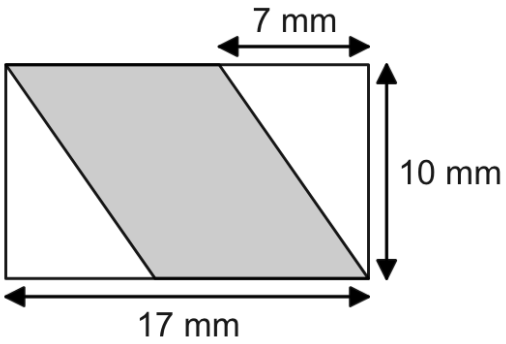
Worked Example

Calculate the area of the parallelograms below:

a)



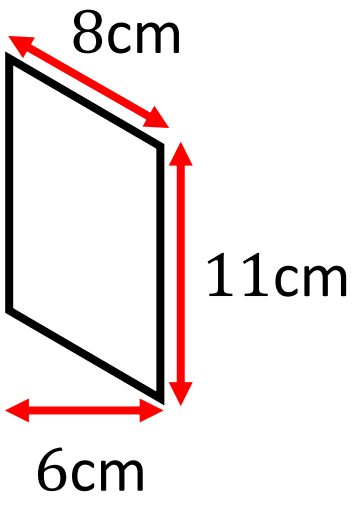
b)



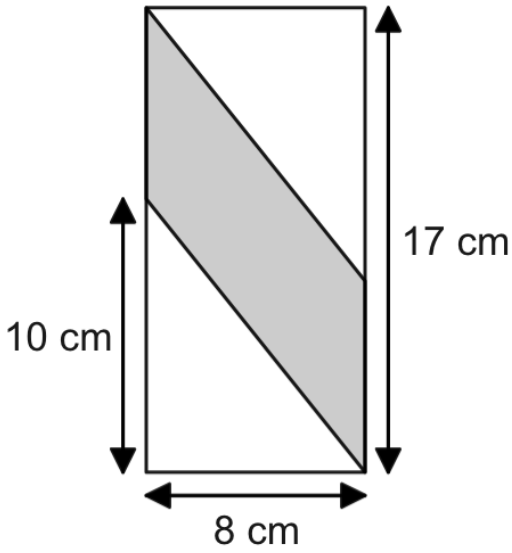
Your Turn

Calculate the area of the parallelograms below:

a)



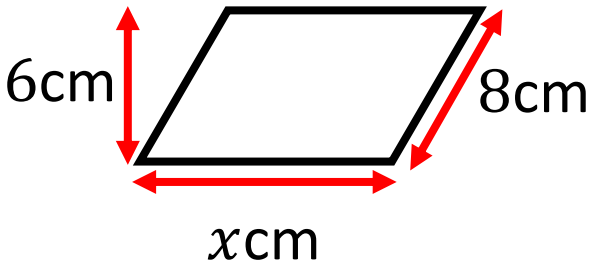
b)



Dr Frost 139a, 139d and 139b

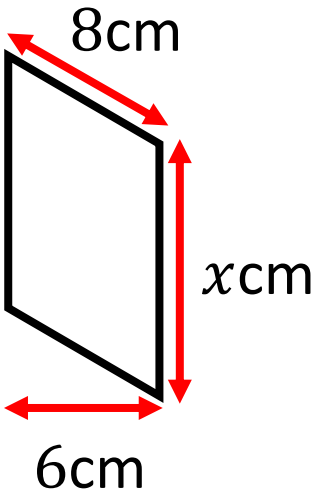
Worked Example

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



Your Turn

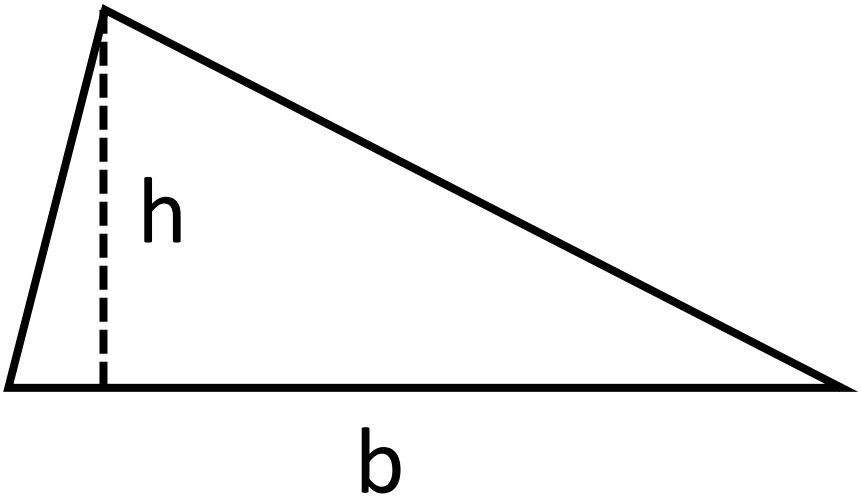
Calculate x if the area of the parallelogram is 66cm^2:

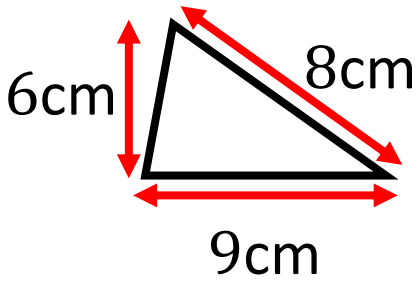
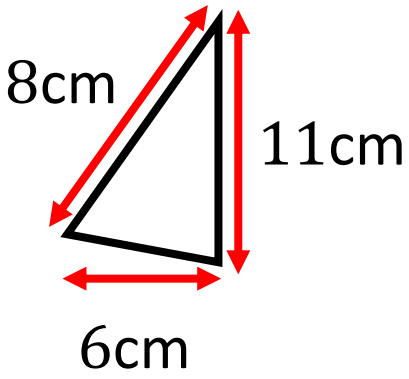


4.7 Area of Triangles

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

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

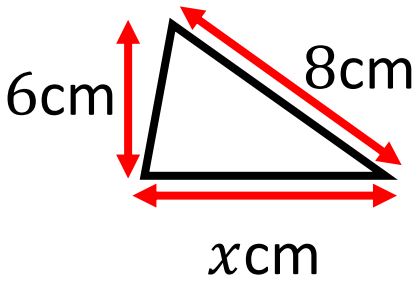


Worked Example	Your Turn
Calculate the area of the triangle:  	Calculate the area of the triangle: 

Dr Frost 140a and 140c

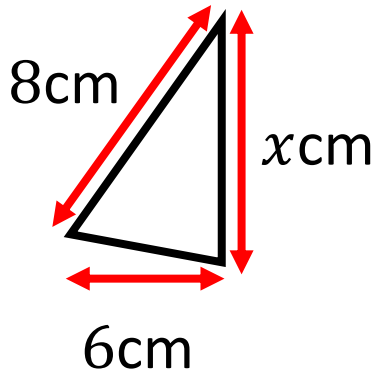
Worked Example

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



Your Turn

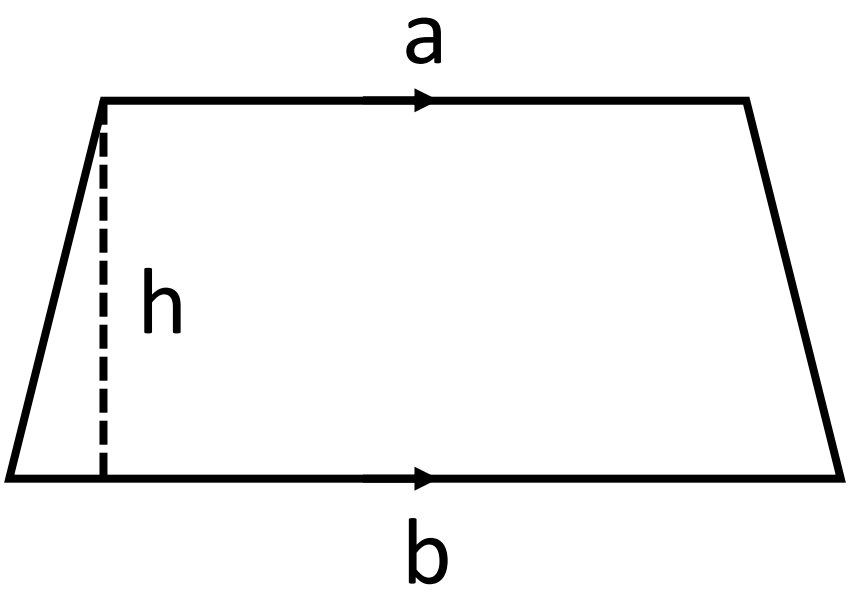
Calculate x if the area of the triangle is 33cm^2:



4.8 Area of Trapeziums

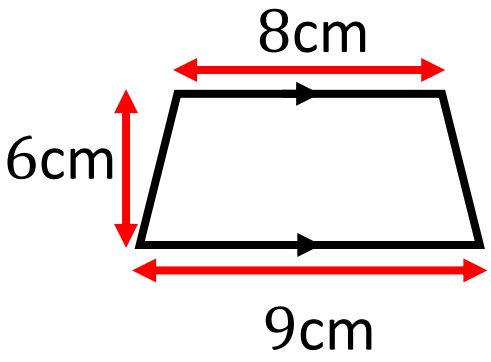
$$\text{Area of a trapezium} = \frac{\text{sum of parallel sides}}{2} \text{ x perpendicular height}$$

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



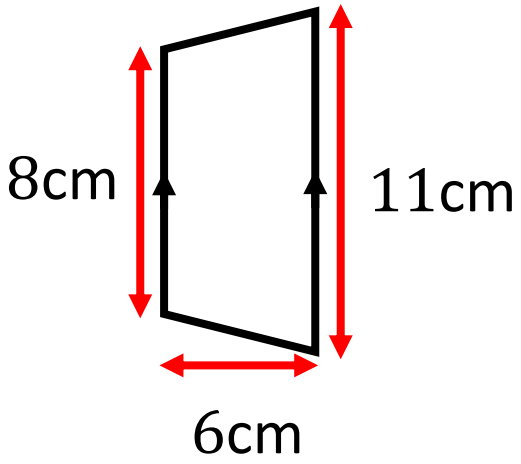
Worked Example

Calculate the area of the trapezium:

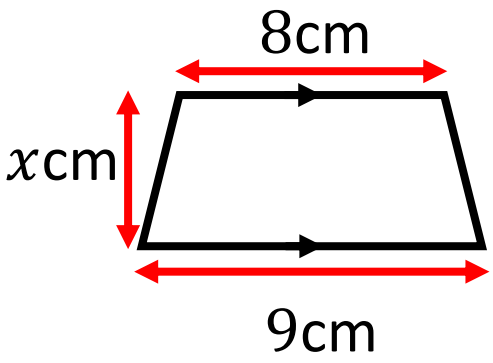
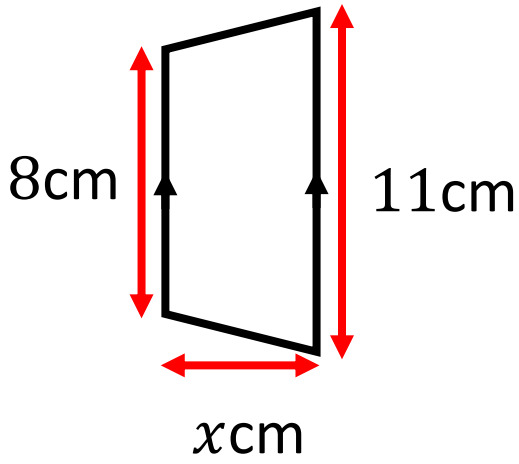


Your Turn

Calculate the area of the trapezium:

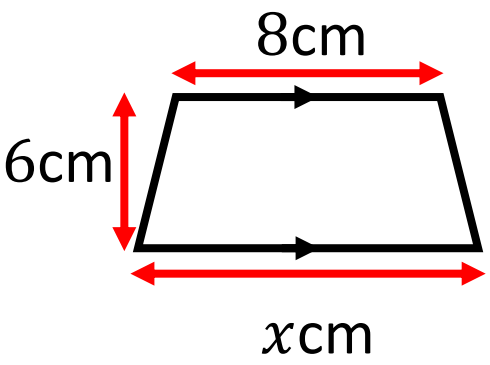


Dr Frost 184a

Worked Example	Your Turn
Calculate x if the area of the trapezium is 51cm^2: 	Calculate x if the area of the trapezium is 57cm^2: 

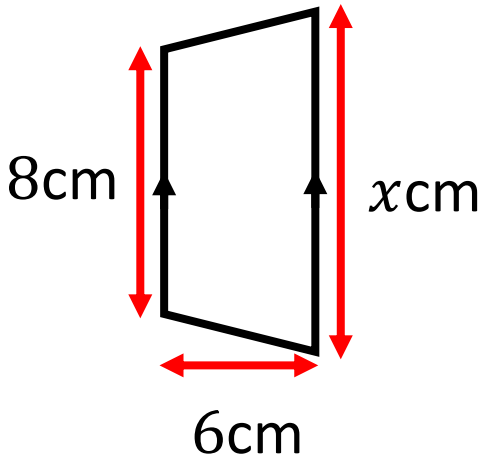
Worked Example

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



Your Turn

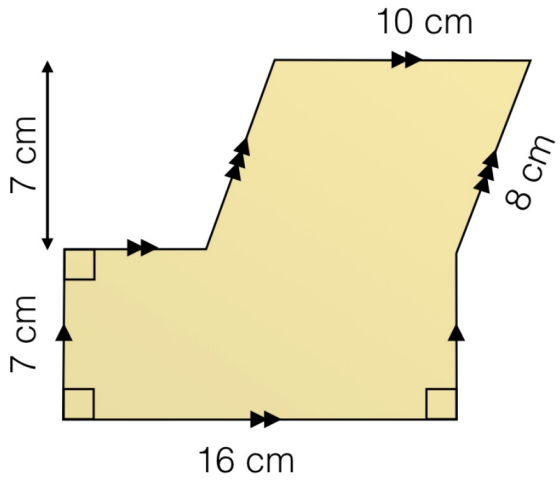
Calculate x if the area of the trapezium is 57cm^2:



4.9 Area of Compound Shapes without Circles

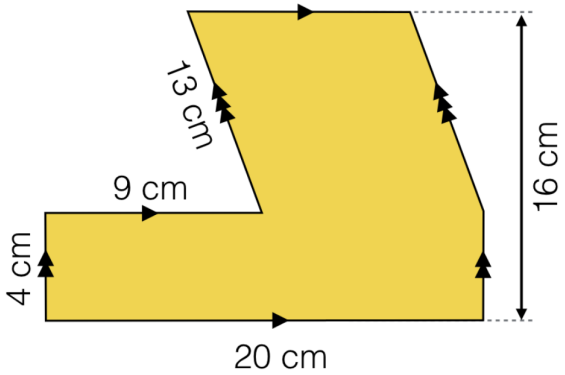
Worked Example

Calculate the area of the compound shape:



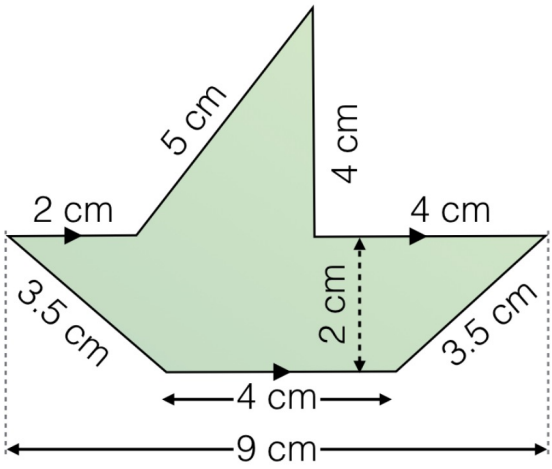
Your Turn

Calculate the area of the compound shape:



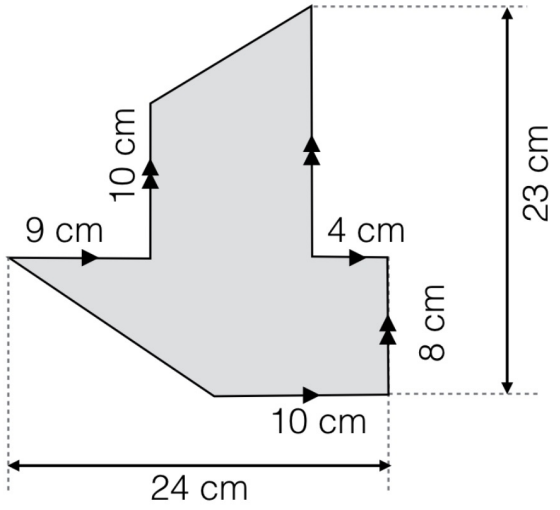
Worked Example

Calculate the area of the compound shape:



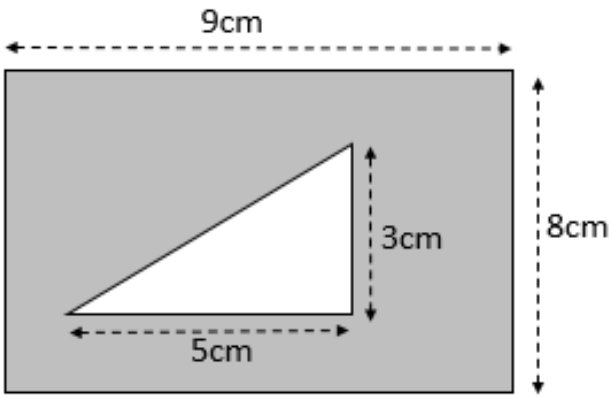
Your Turn

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: