KING EDWARD VI
HANDSWORTH GRAMMAR
SCHOOL FOR BOYS

KING EDWARD VI
ACADEMY TRUST
BIRMINGHAM

# Year 7

# 2024 Mathematics 2025

# Unit 4 Booklet

**HGS Maths**

**Tasks**

**Dr Frost Course**

**Name: _____**

**Class: _____**

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# 1 Rounding

# 1.1 Midpoint of Two Numbers

| Worked Example | Your Turn |
| --- | --- |
| Find the midpoint of $-5$ and $6$ | Find the midpoint of $-6$ and $5$ |

# 1.2 Rounding to the Nearest Multiple

| Worked Example | Your Turn |
| --- | --- |
| Round $63$ to the nearest:<br>a) $10$<br>b) $2$<br>c) $3$ | Round $65$ to the nearest:<br>a) $10$<br>b) $2$<br>c) $3$ |

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

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

# 1.3 Rounding to Decimal Places

| Worked Example | Your Turn |
| --- | --- |
| Round $8.7337$ to:<br>a) $1$ decimal place<br>b) $2$ decimal places<br>c) $3$ decimal places<br>d) Nearest Integer | Round $8.3773$ to:<br>a) $1$ decimal place<br>b) $2$ decimal places<br>c) $3$ decimal places<br>d) Nearest Integer |

| Worked Example | Your Turn |
| --- | --- |
| Round $0.0337$ to:<br>a) $1$ decimal place<br>b) $2$ decimal places<br>c) $3$ decimal places<br>d) Nearest Integer | Round $0.0377$ to:<br>a) $1$ decimal place<br>b) $2$ decimal places<br>c) $3$ decimal places<br>d) Nearest Integer |

| Worked Example | Your Turn |
| --- | --- |
| Round $8.7997$ to:<br>a) 1 decimal place<br>b) 2 decimal places<br>c) 3 decimal places<br>d) Nearest Integer | Round $7.8998$ to:<br>a) 1 decimal place<br>b) 2 decimal places<br>c) 3 decimal places<br>d) Nearest Integer |

**Dr Frost 75b, 75c and 75a**

# 1.4 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:<br>a) 1 significant figure<br>b) 2 significant figures<br>c) 3 significant figures | Round $738906$ to:<br>a) 1 significant figure<br>b) 2 significant figures<br>c) 3 significant figures |

| Worked Example | Your Turn |
| --- | --- |
| Round $2.71828$ to:<br>a) 1 significant figure<br>b) 2 significant figures<br>c) 3 significant figures | Round $7.38906$ to:<br>a) 1 significant figure<br>b) 2 significant figures<br>c) 3 significant figures |

| Worked Example | Your Turn |
| --- | --- |
| Round $0.00271828$ to:<br>a) 1 significant figure<br>b) 2 significant figures<br>c) 3 significant figures | Round $0.00738906$ to:<br>a) 1 significant figure<br>b) 2 significant figures<br>c) 3 significant figures |

| Worked Example | Your Turn |
| --- | --- |
| Round $0.00279999$ to:<br>a) 1 significant figure<br>b) 2 significant figures<br>c) 3 significant figures | Round $0.00739999$ to:<br>a) 1 significant figure<br>b) 2 significant figures<br>c) 3 significant figures |

# 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 $3.54$ kilometres into:<br>a) metres<br>b) centimetres<br>c) millimetres | Convert $5.3$ kilometres into:<br>a) metres<br>b) centimetres<br>c) millimetres |

| Worked Example | Your Turn |
| --- | --- |
| Convert $3.54$ metres into:<br>a) kilometres<br>b) centimetres<br>c) millimetres | Convert $5.3$ metres into:<br>a) kilometres<br>b) centimetres<br>c) millimetres |

| Worked Example | Your Turn |
| --- | --- |
| Convert $3.54$ centimetres into:<br>a) kilometres<br>b) metres<br>c) millimetres | Convert $5.3$ centimetres into:<br>a) kilometres<br>b) metres<br>c) millimetres |

| Worked Example | Your Turn |
| --- | --- |
| Convert $3.54$ millimetres into:<br>a) kilometres<br>b) metres<br>c) centimetres | Convert $5.3$ millimetres into:<br>a) kilometres<br>b) metres<br>c) centimetres |

# 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 $3.54$ tonnes into:<br>a) kilograms<br>b) grams | Convert $5.3$ tonnes into:<br>a) kilograms<br>b) grams |

| Worked Example | Your Turn |
| --- | --- |
| Convert $3.54$ kilograms into:<br>a) grams<br>b) tonnes | Convert $5.3$ kilograms into:<br>a) grams<br>b) tonnes |

| Worked Example | Your Turn |
| --- | --- |
| Convert $3.54$ grams into:<br>a) kilograms<br>b) tonnes | Convert $5.3$ grams into:<br>a) kilograms<br>b) tonnes |

# 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 $3.54$ litres into:<br>a) millilitres<br>b) centilitres | Convert $5.3$ litres into:<br>a) millilitres<br>b) centilitres |

| Worked Example | Your Turn |
| --- | --- |
| Convert $3.54$ millilitres into:<br>a) litres<br>b) centilitres | Convert $5.3$ millilitres into:<br>a) litres<br>b) centilitres |

| Worked Example | Your Turn |
| --- | --- |
| Convert $3.54$ centilitres into:<br>a) millilitres<br>b) litres | Convert $5.3$ centilitres into:<br>a) millilitres<br>b) litres |

# 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.<br><br>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.<br><br>b) Ellie play cards for 414 minutes. Write this duration in hours and minutes. |

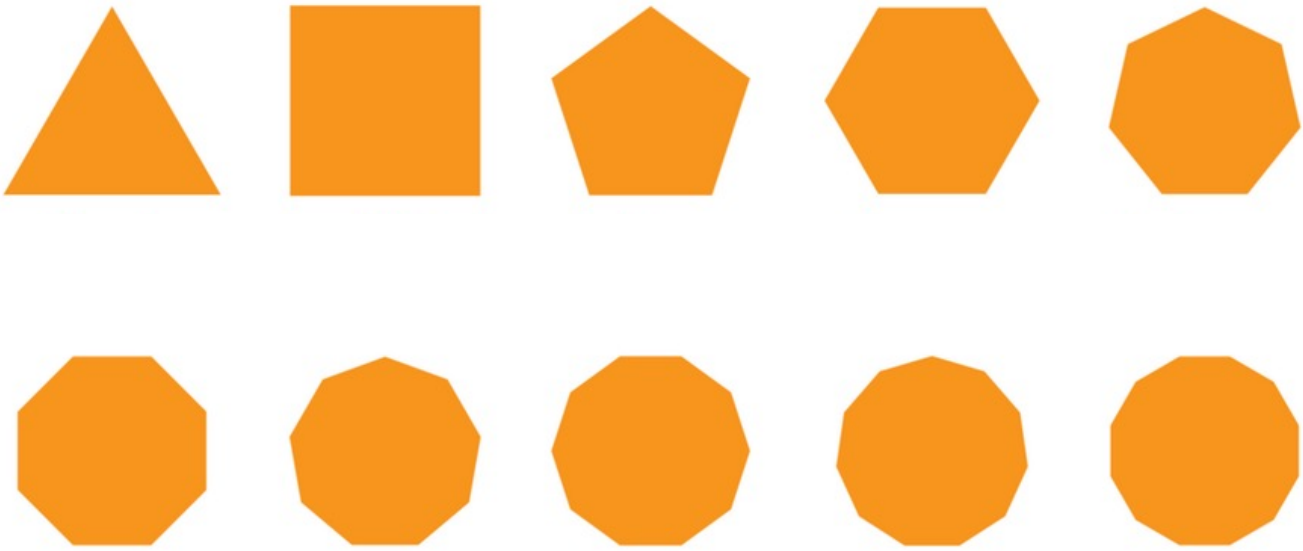
**Dr Frost 59b and 59g**

| Worked Example | Your Turn |
| --- | --- |
| a) Lorrie eats for 12 minutes and 19 seconds. Write this duration in seconds.<br><br>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.<br><br>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



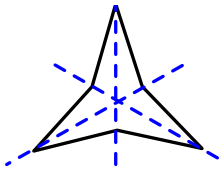
# 3.2 Line Symmetry

# Fluency Practice

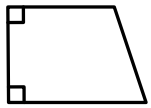
## learn by heart

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.



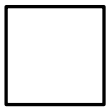
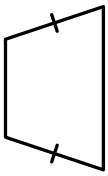
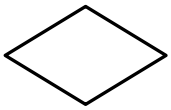
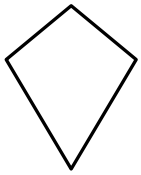
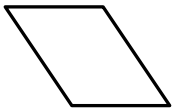
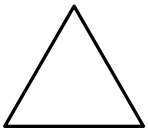
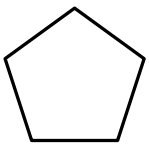
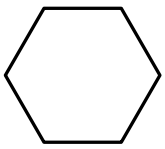
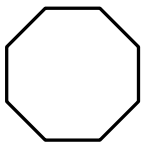
This shape has **3** lines of symmetry.



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

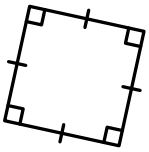
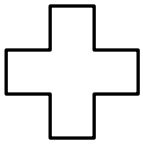
## exercise 3d

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 |
|---|---|---|---|
|  | | |  |

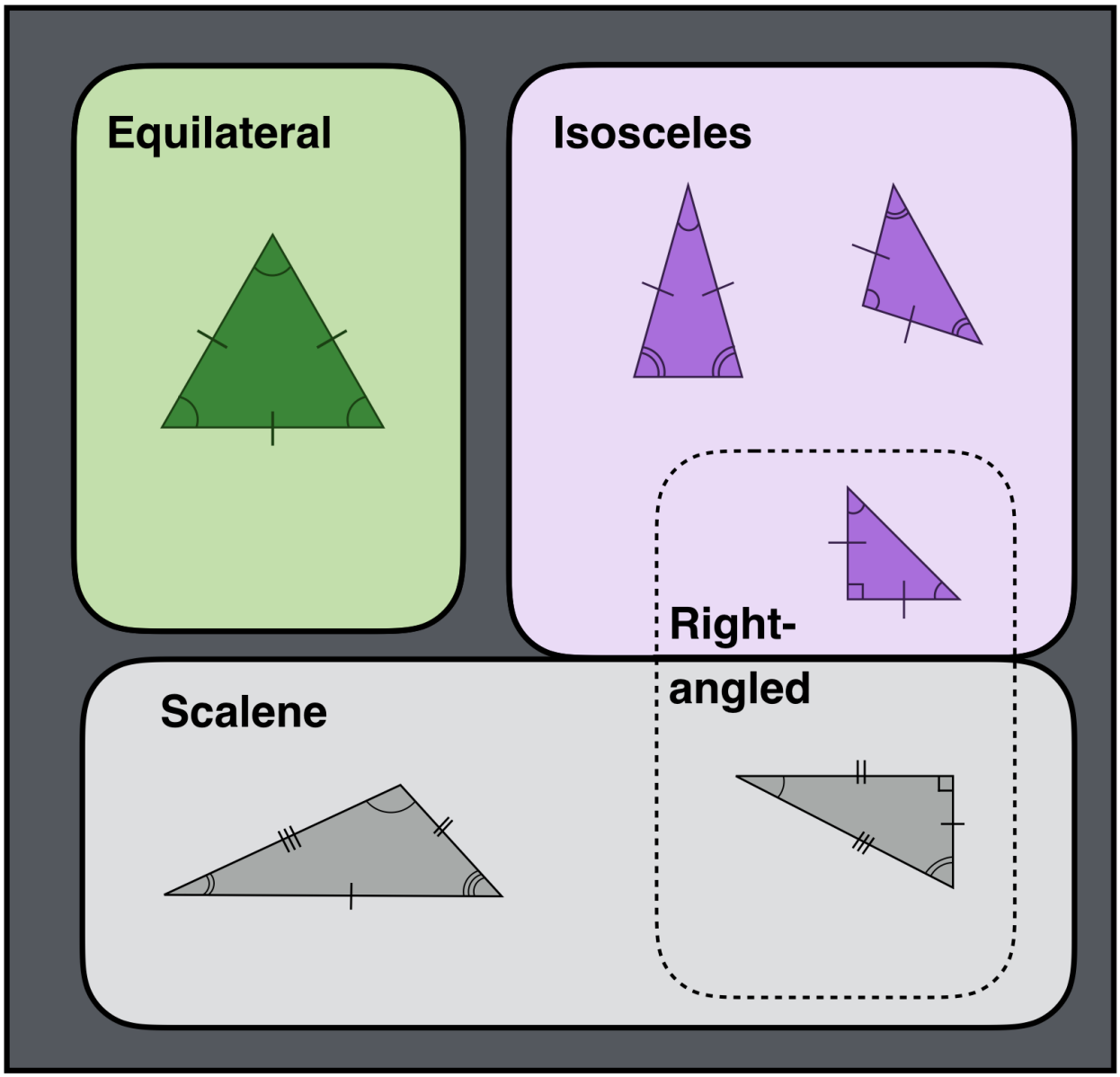
4. Sort these letters into the correct groups, based on their lines of symmetry:

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

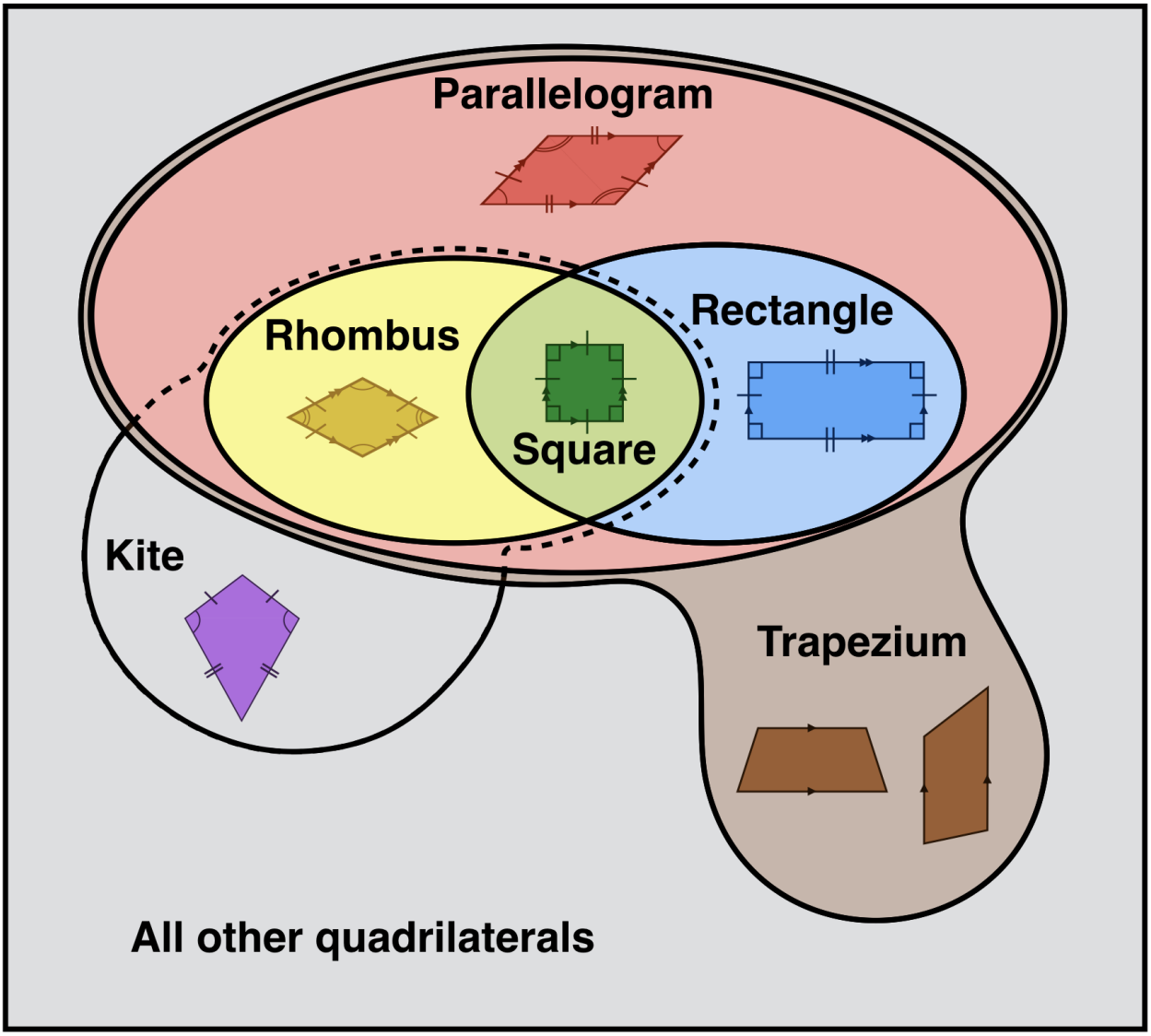
# 3.4 Types and Properties of Triangles



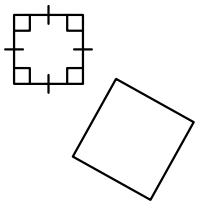
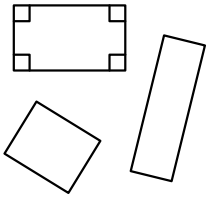
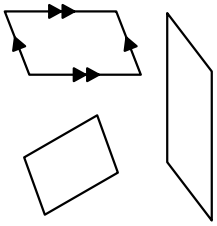
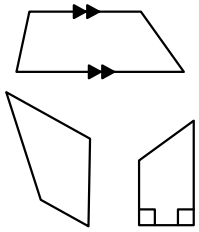
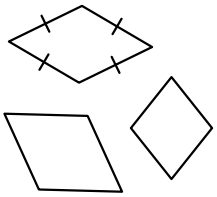
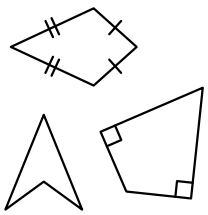
# Types and Properties of Triangles

| Name | Examples | Properties |
|---|---|---|
| **Equilateral** | | |
| **Isosceles** | | |
| **Scalene** | | |
| **Right-Angled** | | |

# 3.5 Types and Properties of Quadrilaterals

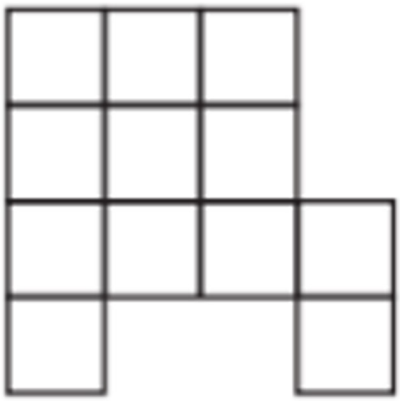
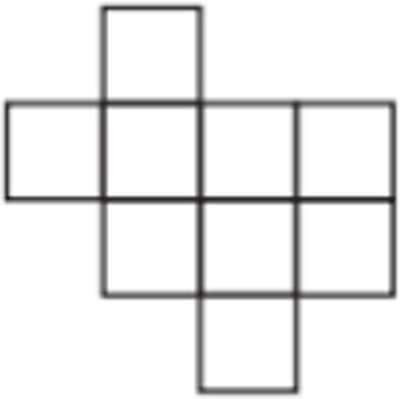


# Types and Properties of Quadrilaterals

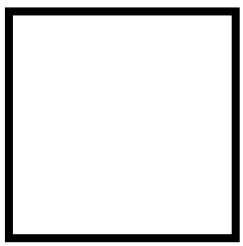
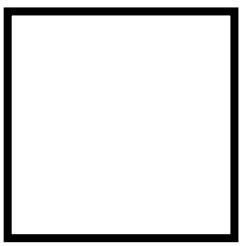
| Name | Examples | Properties | Diagonals |
|---|---|---|---|
| **Square** |  | | |
| **Rectangle** |  | | |
| **Parallelogram** |  | | |
| **Trapezium** |  | | |
| **Rhombus** |  | | |
| **Kite** |  | | |

# 4 Area and Perimeter

# 4.1 Perimeter on a Grid

| Worked Example | Your Turn |
| --- | --- |
| Calculate the perimeter of the shape below:<br>  | Calculate the perimeter of the shape below:<br>  |

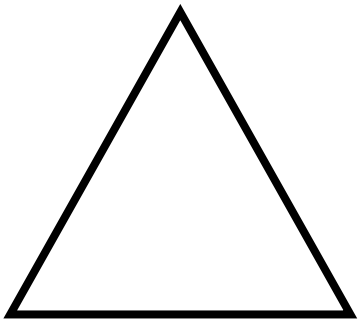
# 4.2 Perimeter

| Worked Example | Your Turn |
| --- | --- |
| Calculate the perimeter of the rectangle:<br><br>6cm<br> <br>2cm<br><br>Calculate the perimeter of the square:<br><br>3cm<br>  | Calculate the perimeter of the rectangle:<br><br>12cm<br> <br>4cm<br><br>Calculate the perimeter of the square:<br><br>6cm<br>  |

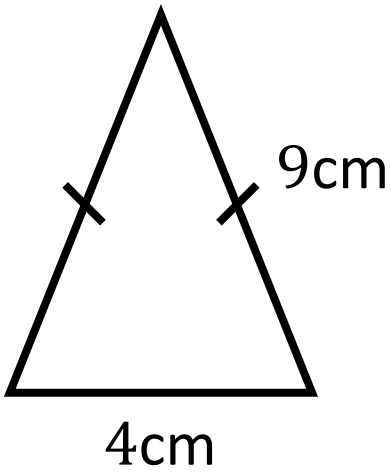
**Dr Frost 79c and 79a**

## Worked Example

Calculate the perimeter of the equilateral triangle:

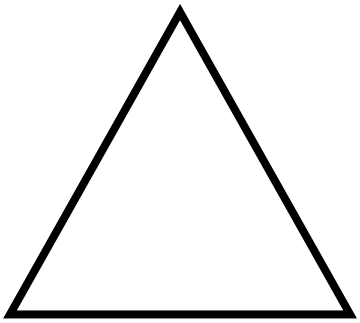



Calculate the perimeter of the isosceles triangle:

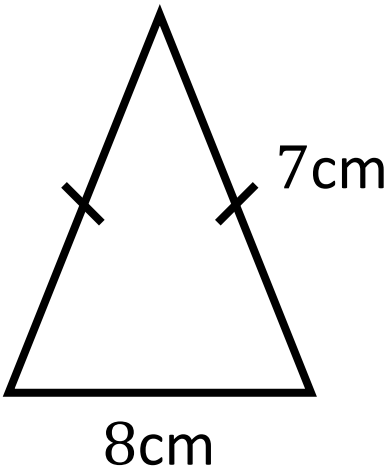



## Your Turn

Calculate the perimeter of the equilateral triangle:

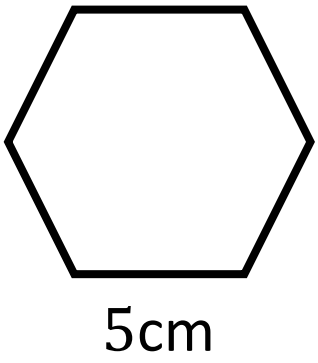



Calculate the perimeter of the isosceles triangle:

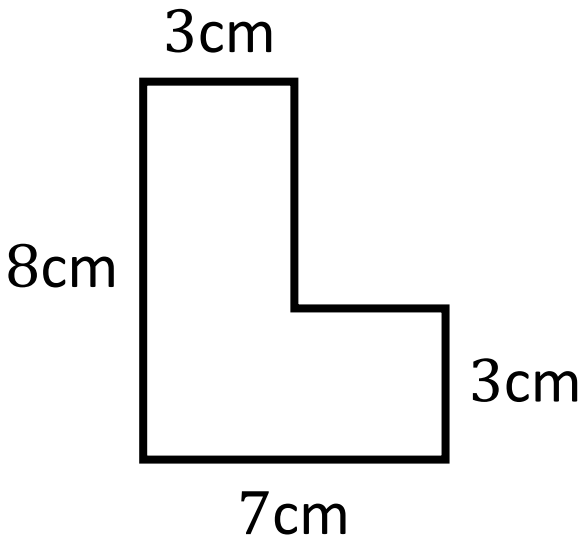


## Worked Example

Calculate the perimeter of the regular hexagon:

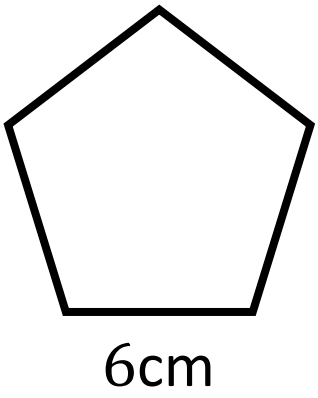



Calculate the perimeter of the shape below:

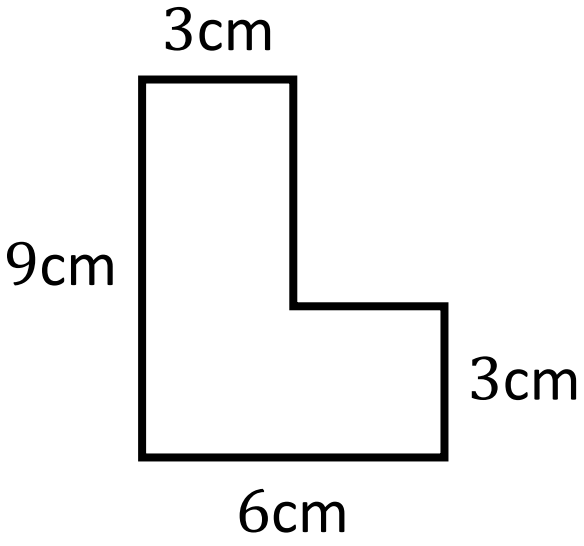



## Your Turn

Calculate the perimeter of the regular pentagon:

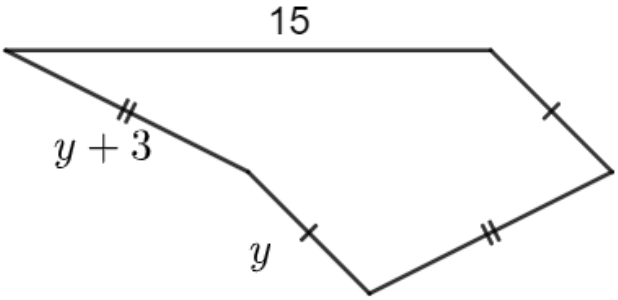



Calculate the perimeter of the shape below:



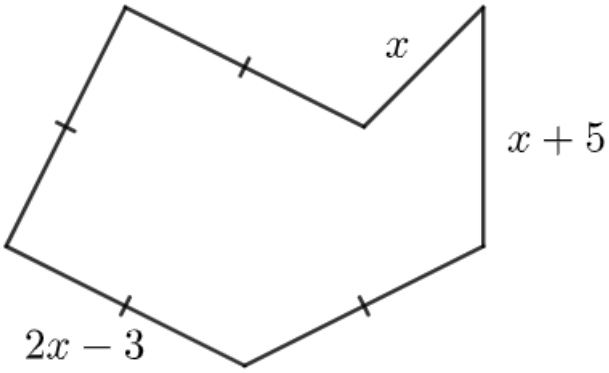
## Worked Example

Find an expression for the perimeter of the following shape:



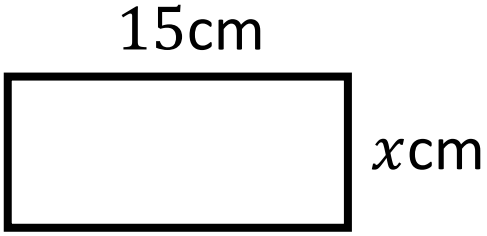

## Your Turn

Find an expression for the perimeter of the following shape:



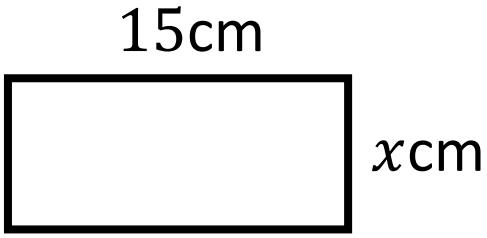
## Worked Example

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




## Your Turn

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

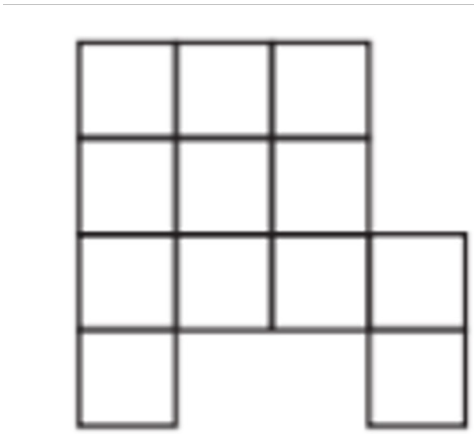


# 4.3 Area on a Grid

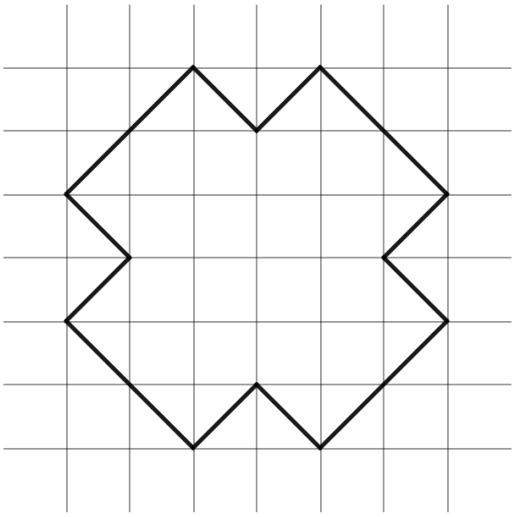
## Worked Example

Calculate the area of the shapes below:

a)



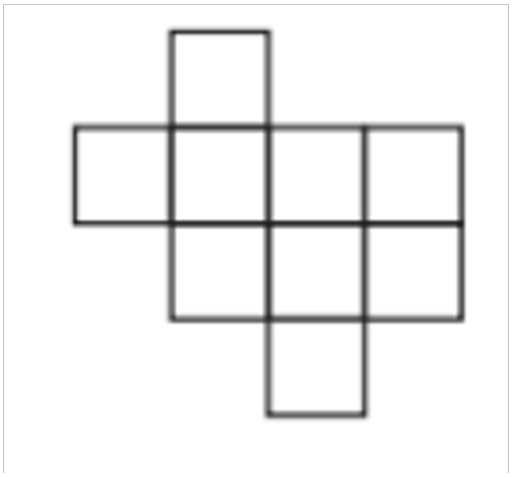
b)



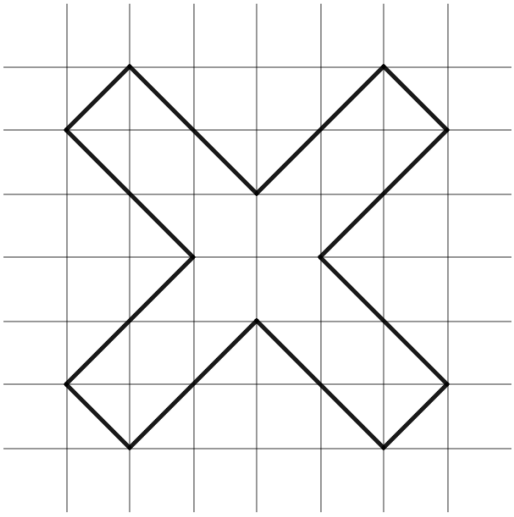
## Your Turn

Calculate the area of the shapes below:

a)



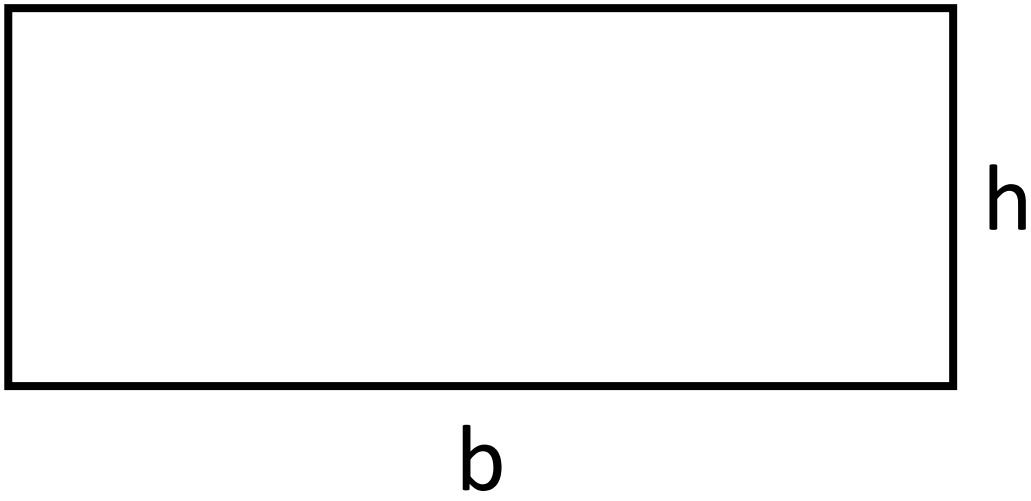
b)

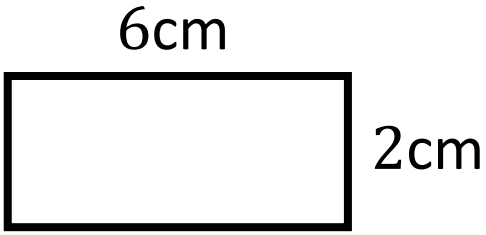
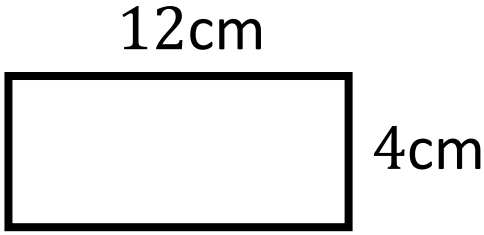
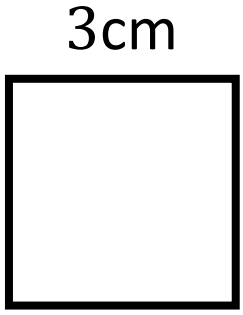
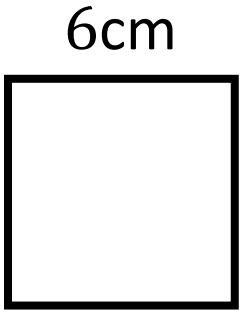


# 4.4 Area of Rectangles

Area = base x height

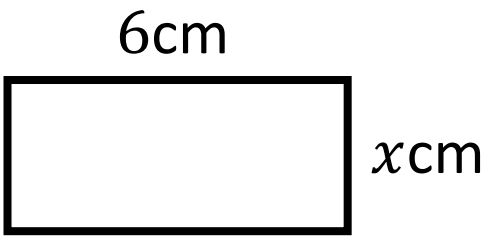
A = b x h



| Worked Example | Your Turn |
| --- | --- |
| Calculate the area of the rectangle:<br>  <br> | Calculate the area of the rectangle:<br>  <br> |
| Calculate the area of the square:<br>  <br> | Calculate the area of the square:<br>  <br> |

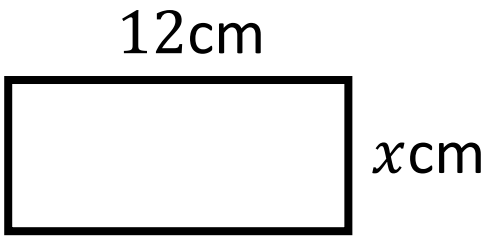
## Worked Example

Calculate $x$ if the area of the rectangle is $12\text{cm}^2$:



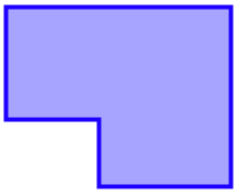

## Your Turn

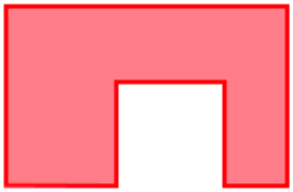
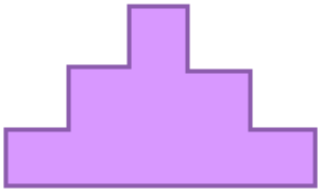
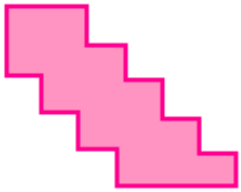
Calculate $x$ if the area of the rectangle is $48\text{cm}^2$:



# 4.5 Area of Rectilinear Shapes

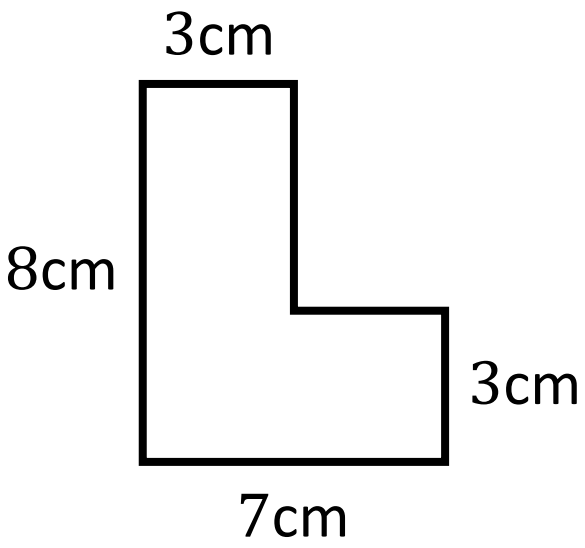
A rectilinear shape is one whose edges all meet at right angles.



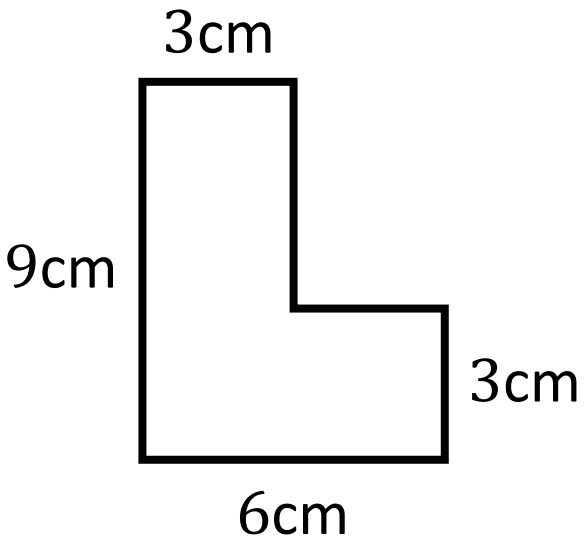
## Worked Example

Calculate the area of the shape below:



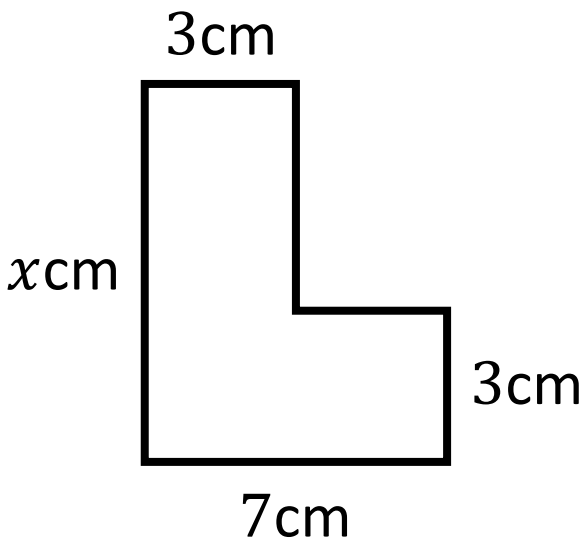

## Your Turn

Calculate the area of the shape below:



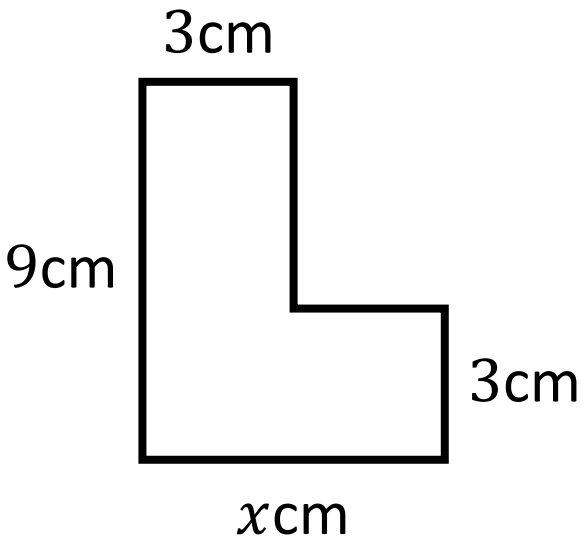
## Worked Example

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




## Your Turn

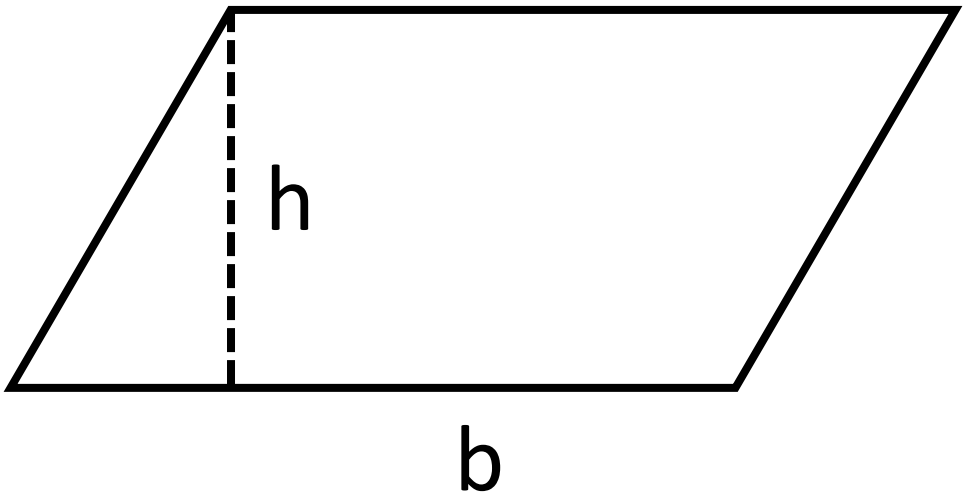
The area of the shape below is $36$ cm$^2$. Find $x$.



# 4.6 Area of Parallelograms

Area of a parallelogram = base x perpendicular height

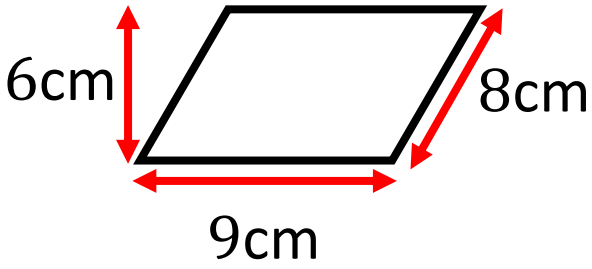
$A = b \times h$



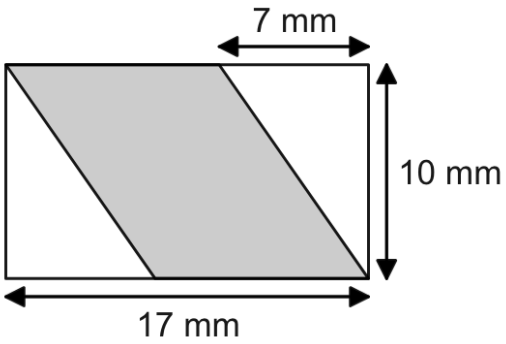
## Worked Example

Calculate the area of the parallelograms below:

a)



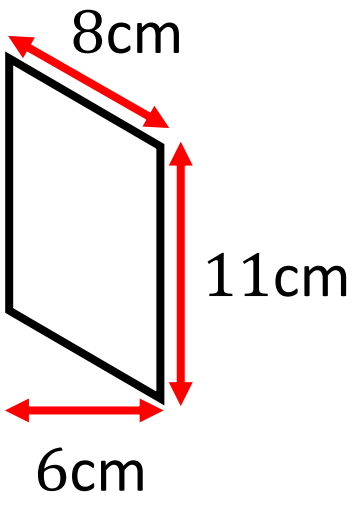

b)



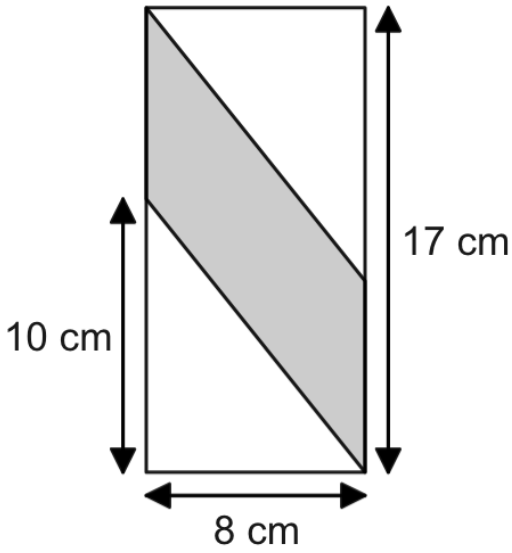

## Your Turn

Calculate the area of the parallelograms below:

a)




b)

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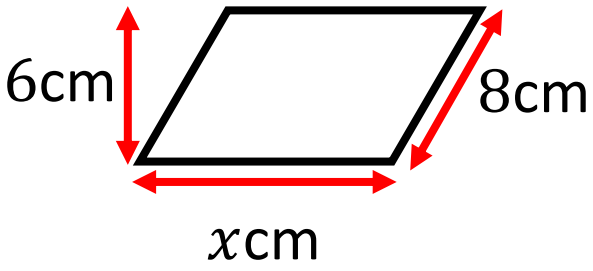
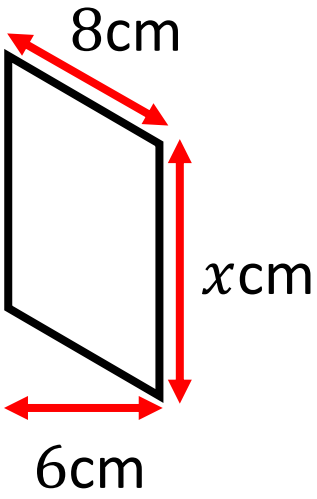
## Worked Example

Calculate $x$ if the area of the parallelogram is $54\text{cm}^2$:




## Your Turn

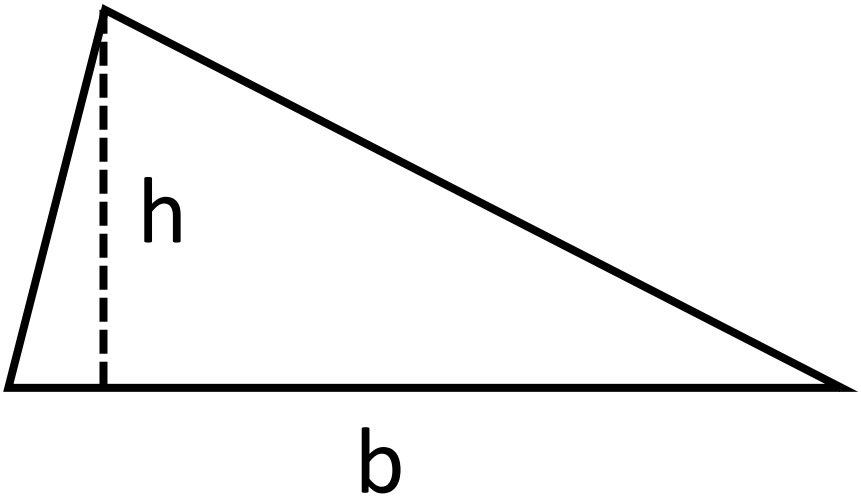
Calculate $x$ if the area of the parallelogram is $66\text{cm}^2$:



# 4.7 Area of Triangles

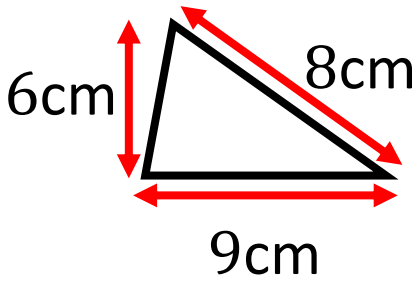
$$\text{Area of a triangle} = \frac{\text{base x perpendicular height}}{2}$$

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



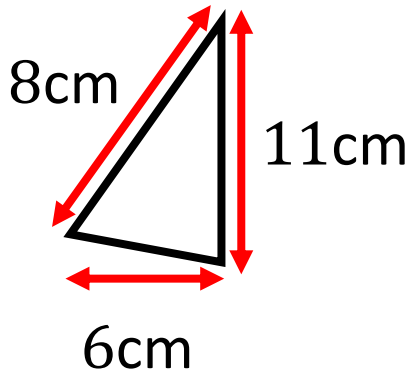
## Worked Example

Calculate the area of the triangle:



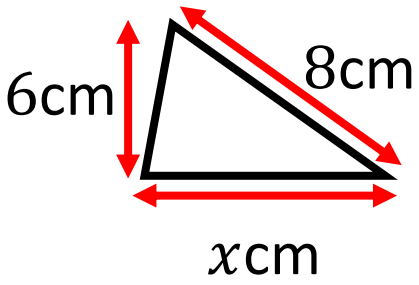

## Your Turn

Calculate the area of the triangle:



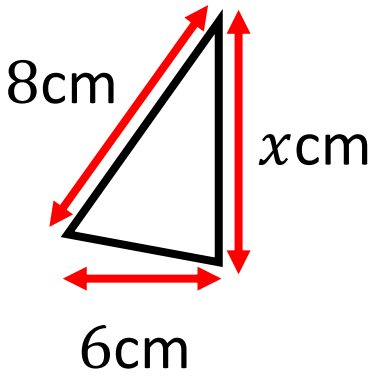
## Worked Example

Calculate $x$ if the area of the triangle is $27\text{cm}^2$:




## Your Turn

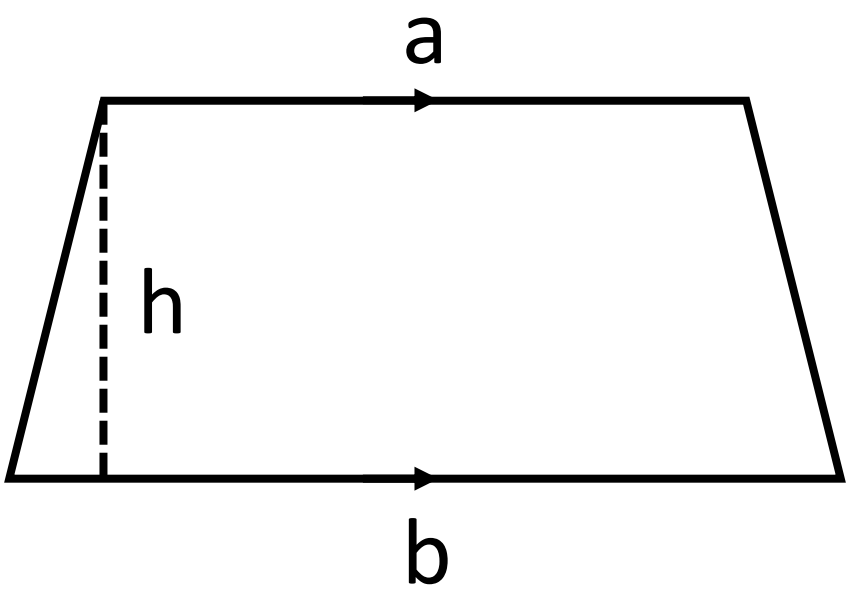
Calculate $x$ if the area of the triangle is $33\text{cm}^2$:



# 4.8 Area of Trapeziums

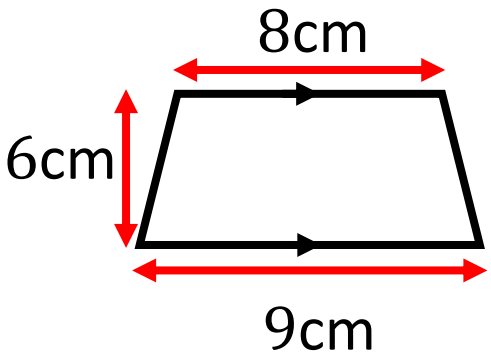
$$\text{Area of a trapezium} = \frac{\text{sum of parallel sides}}{2} \text{ x perpendicular height}$$

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



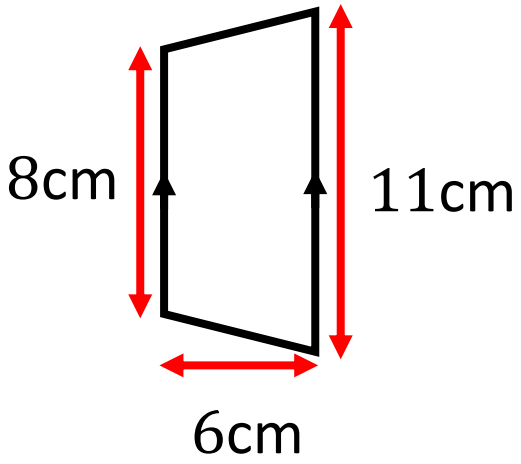
## Worked Example

Calculate the area of the trapezium:




## Your Turn

Calculate the area of the trapezium:

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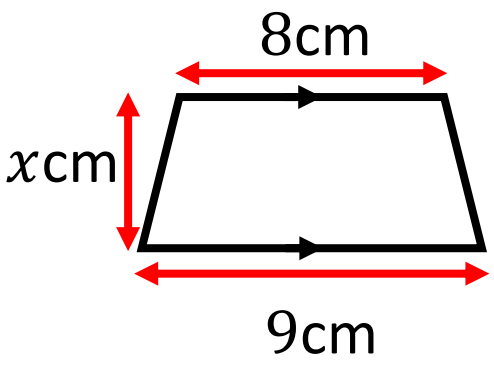
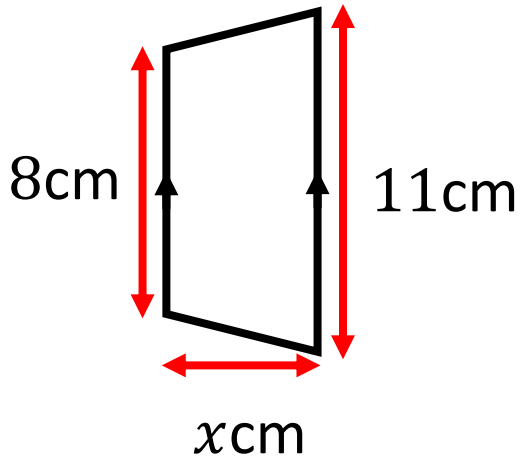
## Worked Example

Calculate $x$ if the area of the trapezium is $51\text{cm}^2$:



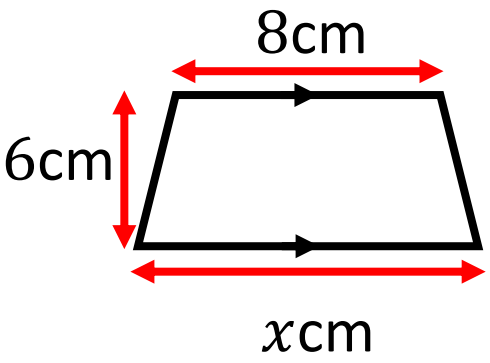

## Your Turn

Calculate $x$ if the area of the trapezium is $57\text{cm}^2$:



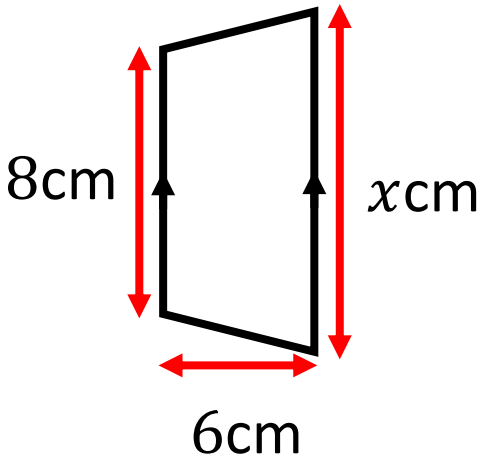
## Worked Example

Calculate $x$ if the area of the trapezium is $51\text{cm}^2$:




## Your Turn

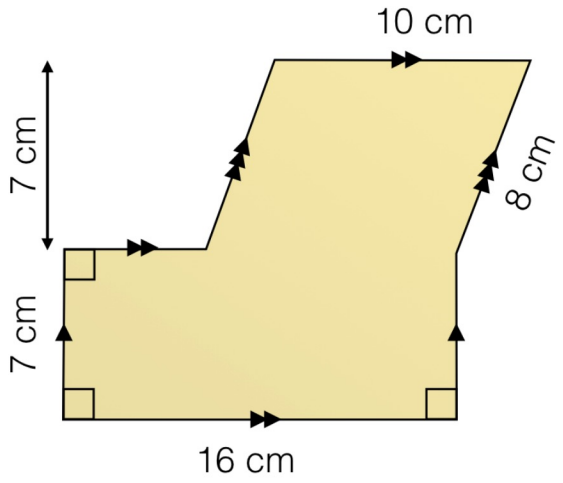
Calculate $x$ if the area of the trapezium is $57\text{cm}^2$:



# 4.9 Area of Compound Shapes without Circles

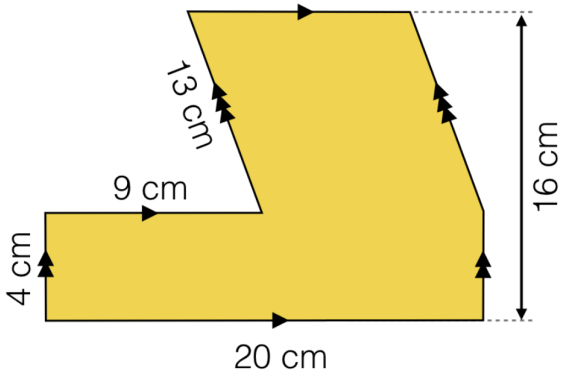
## Worked Example

Calculate the area of the compound shape:



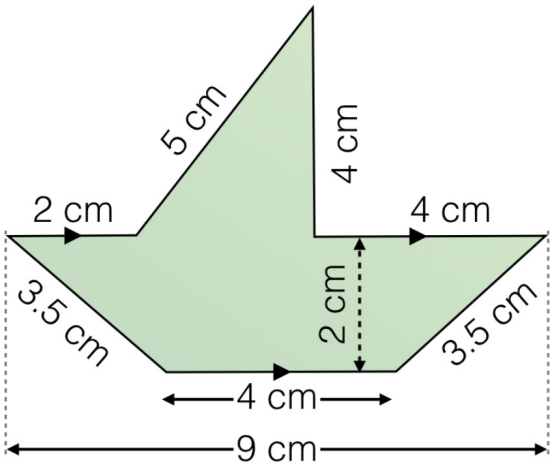

## Your Turn

Calculate the area of the compound shape:



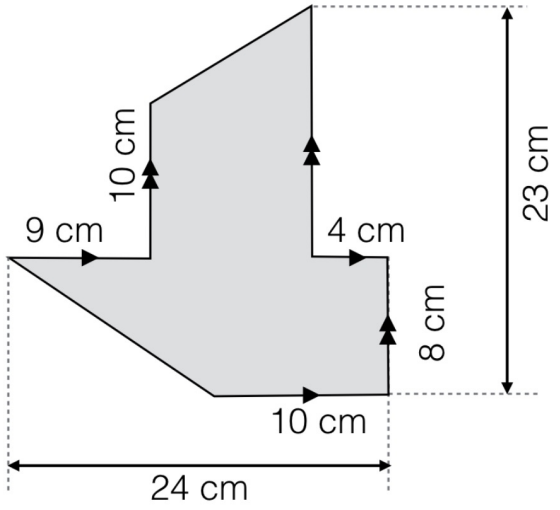
# Worked Example

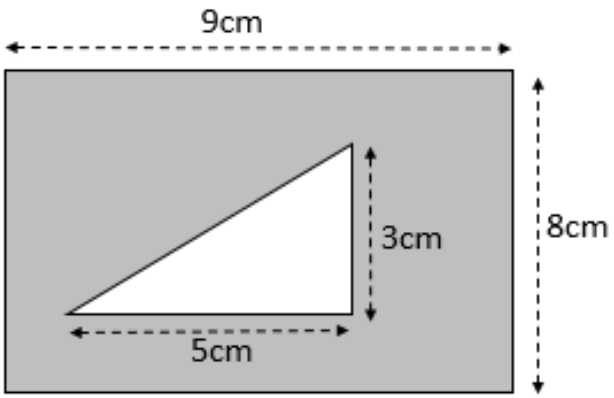
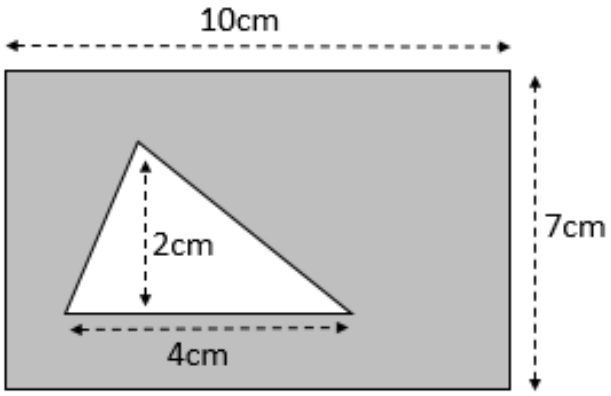
Calculate the area of the compound shape:




# Your Turn

Calculate the area of the compound shape:



| Worked Example | Your Turn |
| --- | --- |
| Calculate the area of the shaded shape:<br>  <br> | Calculate the area of the shaded shape:<br>  <br> |