

Perimeter and Area 1

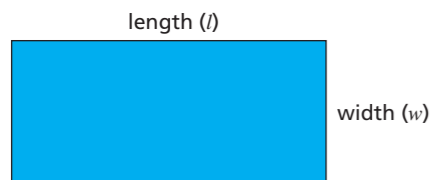
You must be able to:

- Find the perimeter and area of a rectangle
- Find the area of a triangle
- Find the area and perimeter of compound shapes.

Perimeter and Area of Rectangles

- The **perimeter** is the distance around the outside of a 2D shape.
- The formula for the perimeter of a rectangle is:

$$\text{perimeter} = 2(\text{length} + \text{width}) \text{ or } P = 2(l + w)$$
 also
$$\text{perimeter} = 2(\text{length}) + 2(\text{width})$$

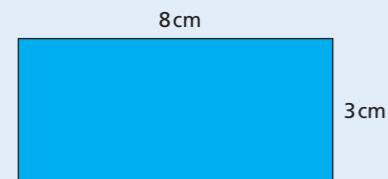


- The formula for the **area** of a rectangle is:

$$\text{area} = \text{length} \times \text{width} \text{ or } A = l \times w$$

Example

Find the perimeter and area of this rectangle.



$$\begin{aligned} \text{Perimeter} &= 2(8 + 3) \\ &= 2 \times 11 \\ &= 22\text{cm} \\ \text{Area} &= 8 \times 3 \\ &= 24\text{cm}^2 \end{aligned}$$

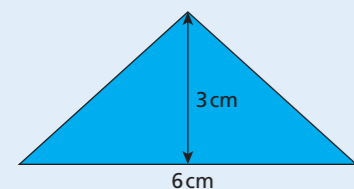
Area of a Triangle

- The formula for the area of a triangle is:

$$\text{area} = \frac{1}{2}(\text{base} \times \text{perpendicular height})$$

Example

Find the area of the following triangle.



$$\begin{aligned} \text{Area} &= \frac{1}{2}(6 \times 3) \\ &= \frac{1}{2}(18) \\ &= 9\text{cm}^2 \end{aligned}$$

Key Point

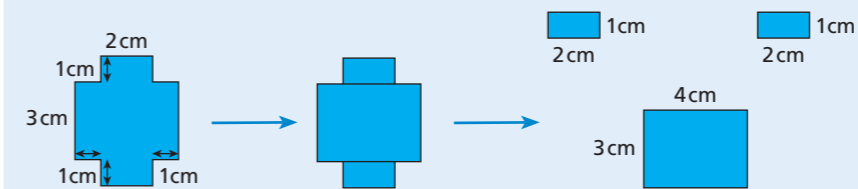
When finding the area of a triangle, always use the perpendicular height.

Area and Perimeter of Compound Shapes

- A **compound** shape is made up from other, simpler shapes.
- To find the area of a compound shape, divide it into basic shapes.

Example

This shape can be broken up into three rectangles.

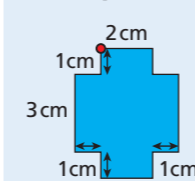


The areas of the individual rectangles are 2cm^2 , 2cm^2 and 12cm^2 .

The area of the compound shape is $2 + 2 + 12 = 16\text{cm}^2$.

- To find the perimeter, start at one corner of the shape and travel around the outside, adding the lengths.

Example



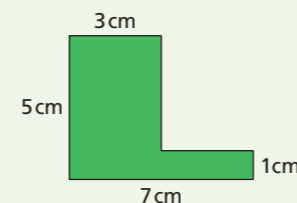
$$\begin{aligned} \text{Perimeter} &= 2 + 1 + 1 + 3 + 1 + 1 + 2 + 1 + 1 + 3 + 1 + 1 \\ &= 18\text{cm} \end{aligned}$$

Key Point

Areas are two-dimensional and are measured in square units, for example cm^2 .

Quick Test

1. Find the perimeter of a rectangle with width 5cm and length 7cm.
2. Find the area of a rectangle with width 9cm and length 3cm. Give appropriate units in your answer.
3. Find the area of a triangle with base 4cm and perpendicular height 3cm.
4. Find the perimeter and area of this shape.



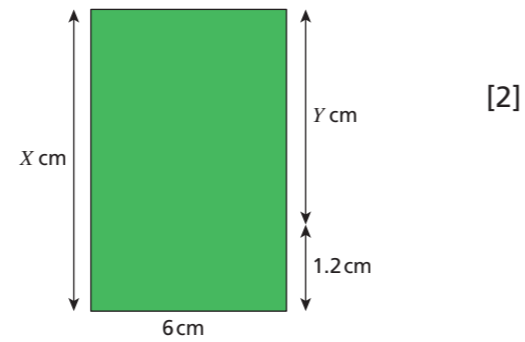
Key Words

perimeter
 area
 perpendicular
 compound

Perimeter and Area

PS 1 The area of the rectangle shown is 48cm^2 .

Find the values of X and Y .



FS 2 Kelly is tiling a wall in her bathroom.

The wall is 4m by 3m. Each tile is 25cm by 25cm.

a) Work out how many tiles Kelly needs to buy for the wall. [3]

The tiles come in packs of 10 and each pack costs £15.

b) Work out how much it will cost Kelly to tile the wall. [2]

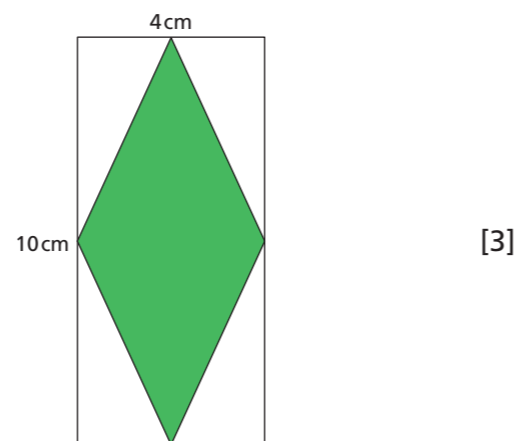
c) How many tiles will she have left over? [1]

Total Marks / 8

PS 1 The diagram shows a rhombus inside a rectangle.

The vertices of the rhombus are the midpoints of the sides of the rectangle.

Find the area of the rhombus.



Total Marks / 3

Statistics and Data

MR 1 Phil and Dave are good darts players.

They record their scores for a match. Their results are shown below.

Phil	64	70	80	100	57	100	41	56	30
Dave	36	180	21	180	10	5	23	25	140

a) Calculate the mean score for each player. [2]

b) Find the range of scores for each player. [2]

c) One of the two players can be picked to play in the next match.
Would you pick Phil or Dave? Explain your answer. [2]

Total Marks / 6


1 The grouped frequency table below gives details of the weekly rainfall in a town in Surrey over a year.

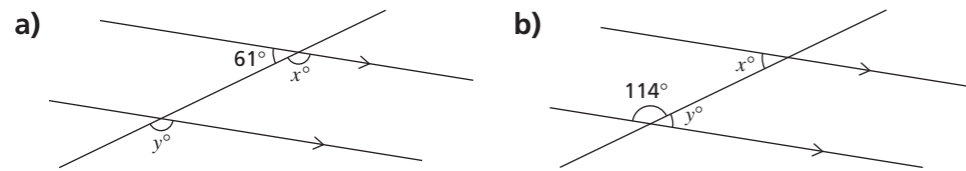
Weekly rainfall in mm	Number of weeks
$0 \leq d < 10$	20
$10 \leq d < 20$	18
$20 \leq d < 40$	10
$40 \leq d < 60$	4

Estimate the mean weekly rainfall. [3]

Total Marks / 3

Angles

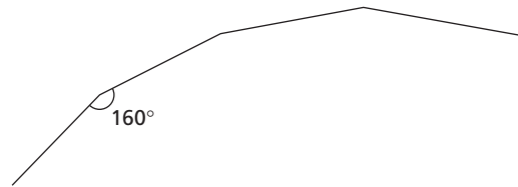
- 1 Find the missing angles in the parallel line diagrams below. 



[4]

- 2 What do the total interior angles add up to in a nonagon? [1]

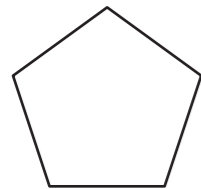
- 3 If each interior angle of a regular polygon is 160° , how many sides does it have? [3]



[3]

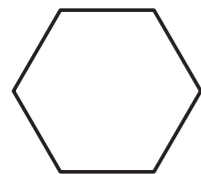
Total Marks / 8

- 1 Explain why regular pentagons cannot be used on their own for tessellation. [3]



[3]


- MR 2 Tessellate the following shape at least six times. [2]



[2]

Total Marks / 5


Probability


- 1 Leanne runs an ice-cream van. At random, she chooses which kind of sprinkles to put on the ice-creams. The table below shows what Leanne did on Sunday. 

Sprinkles	Frequency	Probability
Chocolate	19	
Hundreds and thousands	14	
Strawberry	7	
Nuts	10	

- a) Complete the experimental probabilities in the table above. [2]

- b) What was the probability of getting either nuts or chocolate sprinkles? [2]

- 2 If the probability of winning a raffle prize is 0.47, what is the probability of not winning a raffle prize?  [1]

- 3 a) Complete the table below. 

Sales destination	Probability of going to destination
London	0.26
Cardiff	0.15
Chester	0.2
Manchester	

[1]

- b) Which is the least likely destination to travel to for sales? [1]

Total Marks / 7

- 1 Yvonne works in insurance. The probability that Yvonne gets a claim from a call is 0.68

On Monday she gets 325 calls. What is the estimated number of claims? [2]

[2]

- MR 2 Patrick is a baker. On Monday he made 250 bread rolls. However, Patrick's oven is slightly faulty and burns 0.14 of them. How many rolls were good on Monday? [2]

[2]

Total Marks / 4

Calculator Allowed

- 1 Sam sat on the dock of a bay watching ships for an hour. He collected the following information:

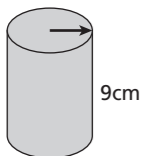
Type	Frequency	Probability
tug boat	12	
ferry boat	2	
sail boat	16	
speed boat	10	

- a) Complete the table's probability column, giving your answers as fractions.
 b) If Sam saw another 75 boats, estimate how many of them would be sail boats.

5 marks

- 2 Work out the surface area and volume of these cylinders.

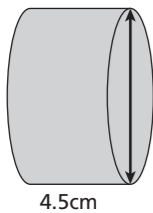
- a) radius = 4cm



Surface area = cm²

Volume = cm³

- b) diameter = 10cm

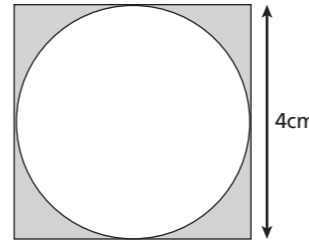


Surface area = cm²

Volume = cm³

8 marks

- 3 The diagram shows a circle inside a square of side length 4cm.



Find the total area of the shaded regions. Give your answer to 2 decimal places.

..... cm² 3 marks

- 4 Barry is planning on buying a car. He visits two garages which have the following payment options:

Mike's Motors

£500 deposit

36 monthly payments of £150

£150 administration fee

Carol's Cars

£600 deposit

12 monthly payments of £50

24 monthly payments of £200

Which garage should Barry buy his car from in order to get the cheapest deal? Show your working to justify your answer.

3 marks

TOTAL

19