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Perimeter & Area

‘How To’ Booklet 15

Perimeter & Area

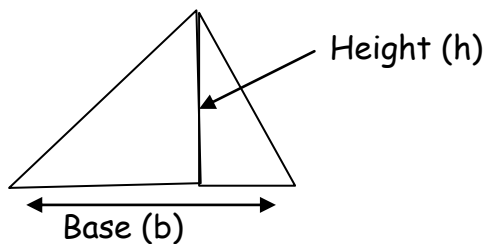
The perimeter of a rectangle is the distance around the edge ($L+W+L+W$)



The area is given by the formula (Area = length x width)

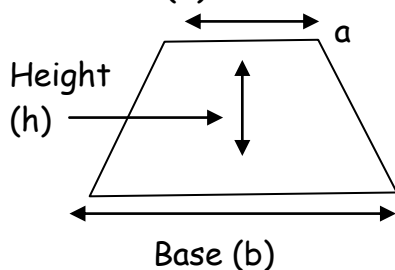
$$A = L \times W$$

Here are some other useful area formulae.



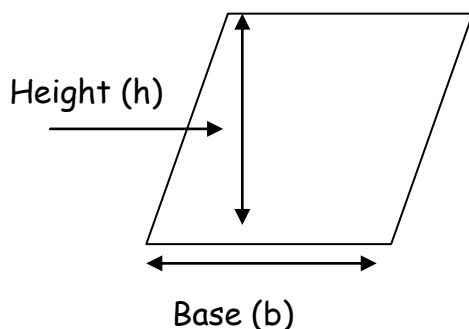
$$\text{Triangle Area} = \frac{\text{Base} \times \text{height}}{2} = \frac{b \times h}{2}$$

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



$$\text{Trapezium Area} = \frac{(a+b) \times \text{Height (h)}}{2}$$

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



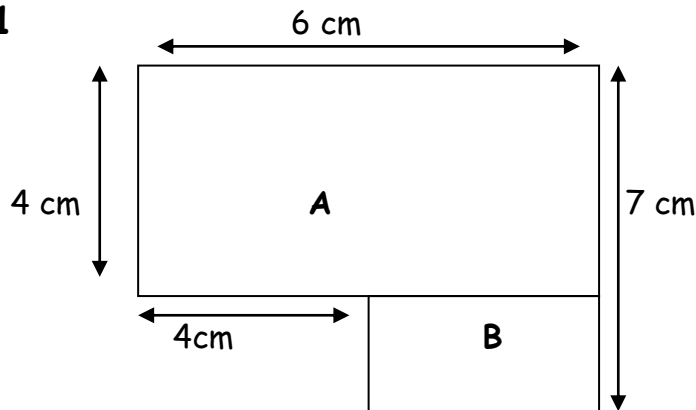
$$\text{Parallelogram Area} = b \times h$$

$$A = b \times h$$

Composite Shapes

The area of a composite shape is calculated by splitting the shape into separate shapes. The area of each one is then calculated and the areas are added together to find the total area. In examples below, the shapes have been divided into two shapes.

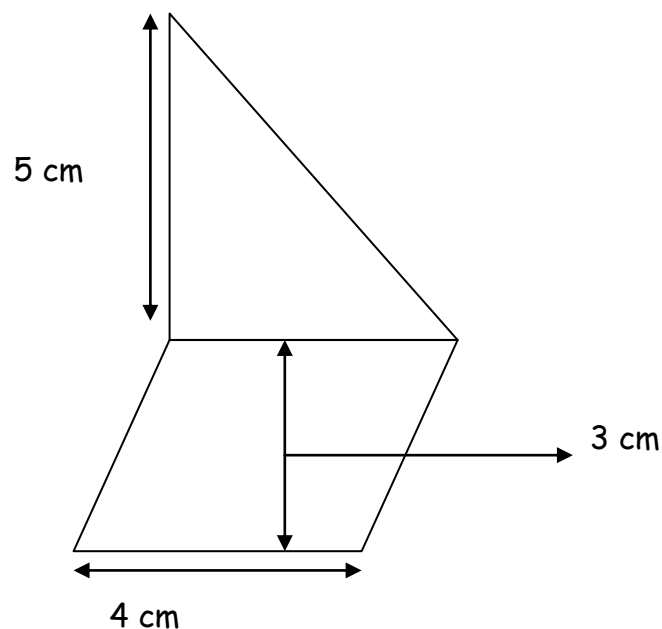
Example 1



Area of shape

$$A = 6 \times 4 = 24 \text{ cm}^2$$
$$B = 3 \times 2 = 6 \text{ cm}^2$$

Example 2



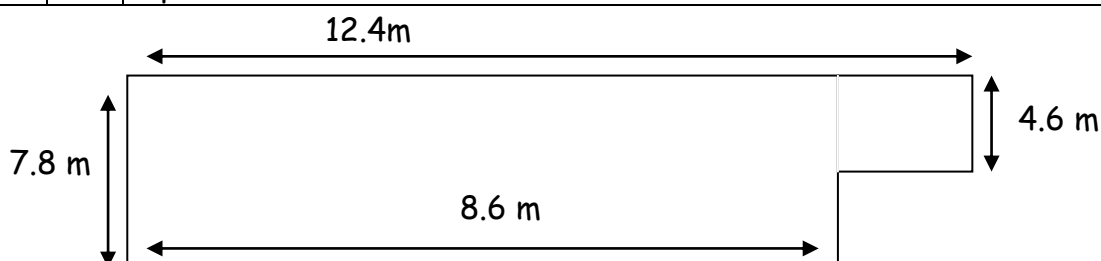
Area of shape

$$C = \frac{1}{2} (5 \times 4) = 10 \text{ cm}^2$$
$$D = (4 \times 3) = 12 \text{ cm}^2$$

Total Area = $10 + 12$
 22 cm^2

Applying Your Knowledge To Everyday Situations

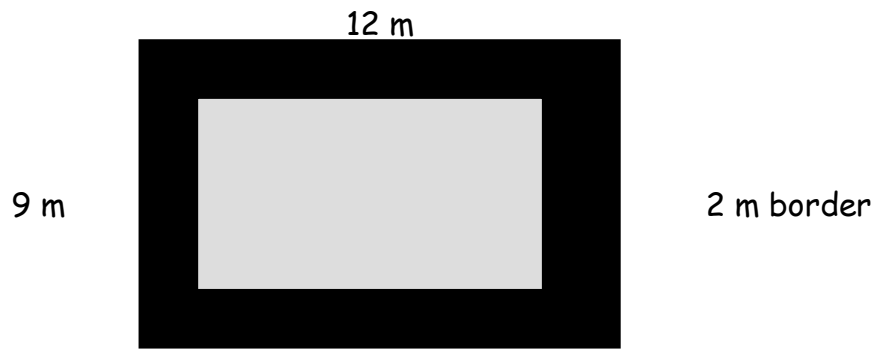
1	You need to re-glaze a window. The window frame is 1.25m wide and 2.3 m long. Find	
	a	the area of the window frame
	b	the total cost of the glass if it is £4.80 for each m^2
	c	the perimeter of the window frame
2	You need to buy plants for the flowerbed. The bed is 63.5 cm long by 41.5 cm wide. Find	
	a	its exact area
	b	its perimeter
3	You want to tile a table top. The top measures 2.44m long x 1.25m wide. Find	
	a	its area
	b	its perimeter
4	An organisation needs to re-carpet a straight corridor. The corridor measures 15.5m long by 1.25m wide. To decide how many square metres of carpet is required. Find	
	a	its exact area
	b	its area to the nearest whole m^2
5	You are offered a roll of furnishing fabric at a reduced cost. It should sell at £6.99 a square metre but you can buy it for £1.20 per square metre. The material is 1.6m wide by 9.75m long. Find	
	a	the total area of the roll
	b	the cost of the whole roll
6	You need to replace a broken panel. The original panel is 54.5 cm long by 31.2 cm wide. You will buy the material by the square metre. Find	
	a	the exact area of the panel
	b	the area of the panel to the nearest 100 cm^2
7	You need to order turf to make a new lawn as illustrated below.	
	a	find the total area in order that you can buy the correct amount of square metres of turf.



8	A triangular shape has to be painted on some scenery in an outdoor theatre. The triangle has a base of 6m and a height of 7 m. To calculate the amount of paint required find the total area.	
9	A garage floor is 4.5 m wide and 8.25 m long. Find	
	a	its area and its perimeter
	b	the cost of concreting it, if one square metre of concrete costs £4.40.
10	A flat roof is 13.6 m long and 5.25m wide	
	a	find its area and its perimeter
	b	the roof is covered with waterproof felt costing £2.75 per m ² Find the cost of the felt required for the whole roof
	c	The perimeter of the roof is fitted with a gutter costing £0.65 per metre length. Find the cost of the guttering required.
11	A person decides to lay a rectangular lawn 21.5 m long and 8.4 m wide. Find	
	a	the area of the lawn i) exactly ii) to the nearest whole m ²
	b	the cost of the turf, if each m ² costs 25 pence.
	c	the length of the perimeter (or edge) of the lawn i) exactly ii) to the nearest whole metre.
	d	the cost of plastic edging if each metre length of it costs 15 pence.
12	A vegetable garden is 18.4m long and 15.6m wide. Find	
	a	its exact area
	b	its area to the nearest whole m ²
	c	its perimeter
	d	the cost of fencing the perimeter, if a metre length of fence costs £2.45
13	A rectangular piece of ground is to be made into a car park 67.5 m long and 51.8m wide. Find	
	a	the area of the car park
	b	the cost of the tarmac required to surface it if one m ² of tarmac costs £2.75.
	c	the perimeter of the car park
	d	the cost of the kerbstones around the perimeter, if a metre length costs 45 pence.

Borders

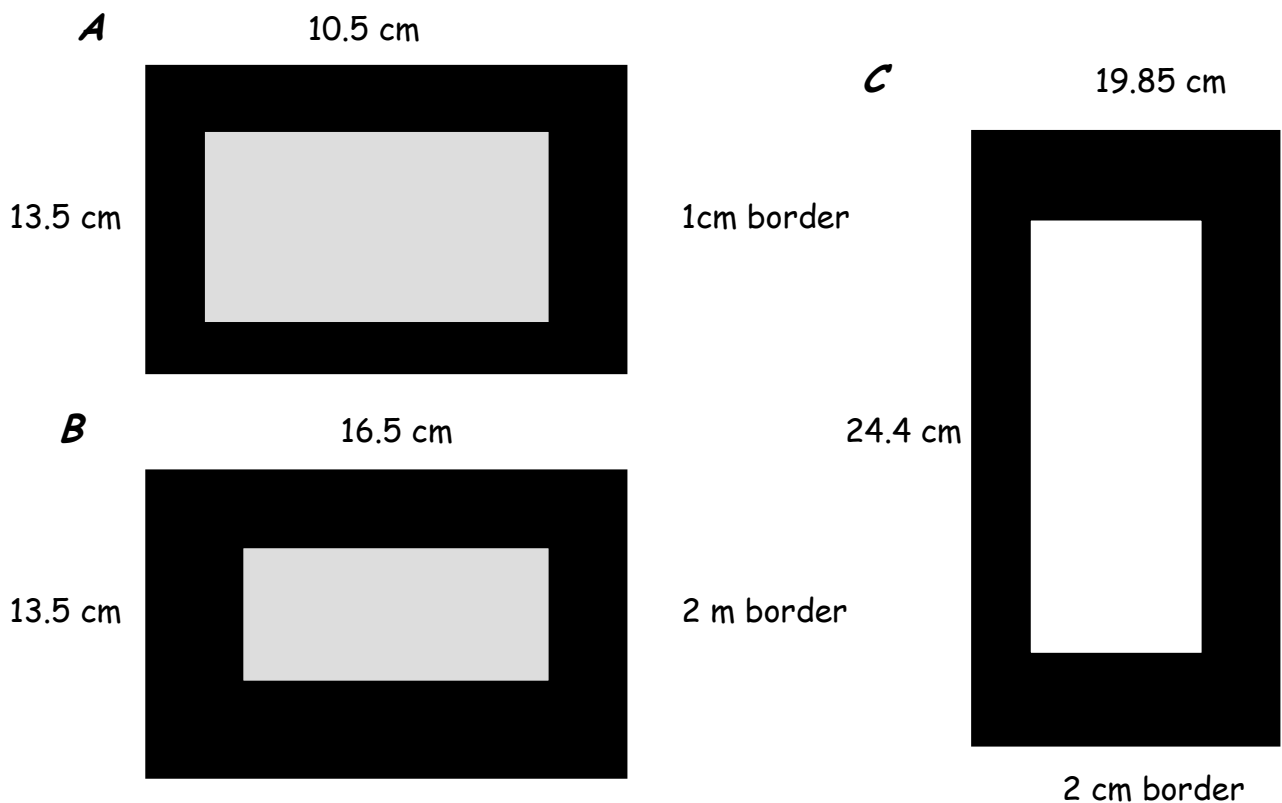
Example



To calculate the area of the border -
(area of large rectangle) - (area of small rectangle)

$$\begin{array}{rcl} (12 \times 9) - (8 \times 5) \\ 108 & - & 40 \\ & = & 68\text{m}^2 \end{array}$$

1. A photographer has for sale three sizes of photographs with a border round.



For each size, find the area of:	
a	the photograph without its border
b	the photograph and border together
c	the border

2	A rectangular garden is 18.5m long and 12.4 wide. It has a central lawn 10.8m long and 6.5 m wide. Find the area of	
	a	the garden
	b	the lawn
	c	the border around the lawn
3	A postcard 14.2 cm by 9.5cm has a stamp stuck in one corner. The stamp is 2.4 cm by 2 cm. Find the area of	
	a	the postcard
	b	the stamp
	c	the postcard not covered by the stamp
4	A garden has a lawn 8.2m long and 6.5m wide. The border round the lawn is 1.5m wide on each side as shown. Find	
	a	The area of the lawn
	b	the length l of the garden
	c	the width w of the garden
	d	the total area of the garden
	e	the area of the border

