

Name _____

Date _____

15.1 Perimeter and area of rectangles — worksheet

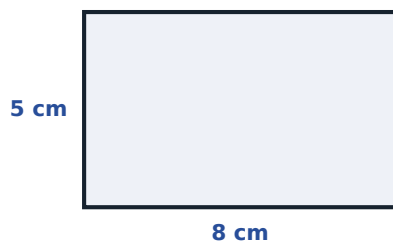
Find the perimeter and area of rectangles and squares, work backwards from a given area or perimeter, and understand what congruent means. · 67 questions · Show your working.

Remember

- **Perimeter** is the distance round the edge. It is a length, measured in mm, cm, m or km.
- **Area** is the surface covered. It is measured in **square** units, because it is a length times a length.
- Rectangle: **perimeter** = $2(l + w)$ and **area** = $l \times w$.
- Square of side s : **perimeter** = $4s$ and **area** = s^2 .
- To work backwards from an area, **divide**: width = area $\div$ length.
- To work backwards from a perimeter, take off the two sides you know first, then halve what is left.
- Two shapes are **congruent** when corresponding sides and angles are equal — same shape **and** same size.
- Equal areas do not make shapes congruent: 6×4 and 12×2 both give 24 cm^2 .
- Doubling both sides multiplies the area by 4, not by 2.

A · Fluency — Perimeters, areas and missing sides.

- 1 A rectangle is 8 cm long and 5 cm wide. What is its **perimeter**, in centimetres?



- 2 A rectangle is 12 cm long and 7 cm wide. What is its **perimeter**, in centimetres?



- 3 A rectangle is 9 cm long and 4 cm wide. What is its **perimeter**, in centimetres?



- 4 A rectangle is 15 cm long and 6 cm wide. What is its **perimeter**, in centimetres?



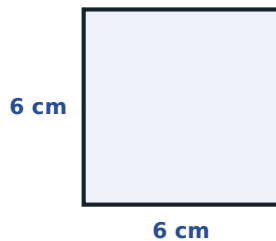
- 5 A rectangle is 11 cm long and 3 cm wide. What is its **perimeter**, in centimetres?



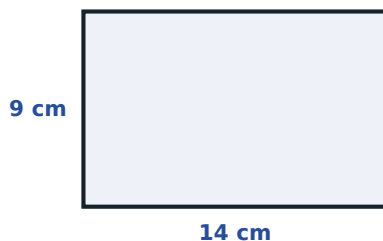
- 6 A rectangle is 20 cm long and 8 cm wide. What is its **perimeter**, in centimetres?



- 7 A rectangle is 6 cm long and 6 cm wide. What is its **perimeter**, in centimetres?



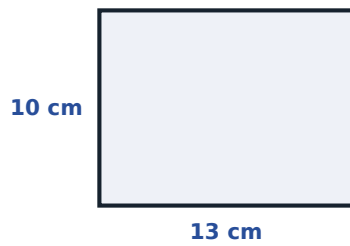
- 8 A rectangle is 14 cm long and 9 cm wide. What is its **perimeter**, in centimetres?



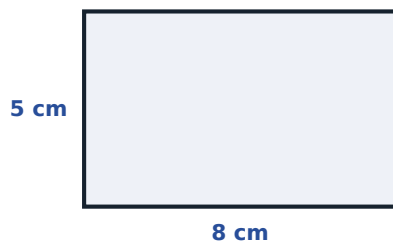
- 9 A rectangle is 25 cm long and 4 cm wide. What is its **perimeter**, in centimetres?



- 10** A rectangle is 13 cm long and 10 cm wide. What is its **perimeter**, in centimetres?



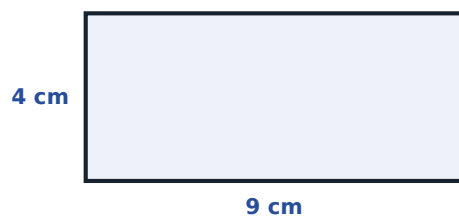
- 11** A rectangle is 8 cm long and 5 cm wide. What is its **area**, in square centimetres?



- 12** A rectangle is 12 cm long and 7 cm wide. What is its **area**, in square centimetres?



- 13** A rectangle is 9 cm long and 4 cm wide. What is its **area**, in square centimetres?



- 14** A rectangle is 15 cm long and 6 cm wide. What is its **area**, in square centimetres?



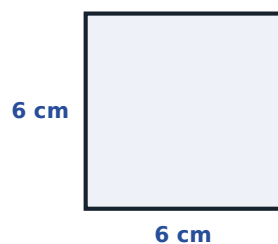
- 15** A rectangle is 11 cm long and 3 cm wide. What is its **area**, in square centimetres?



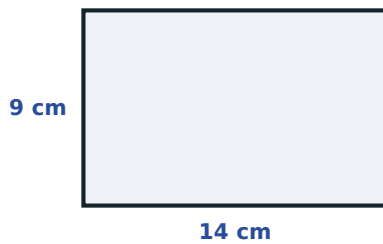
- 16** A rectangle is 20 cm long and 8 cm wide. What is its **area**, in square centimetres?



- 17** A rectangle is 6 cm long and 6 cm wide. What is its **area**, in square centimetres?



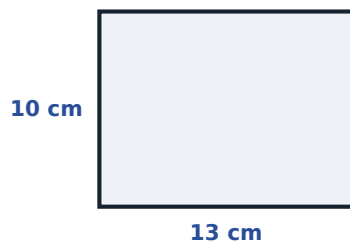
- 18** A rectangle is 14 cm long and 9 cm wide. What is its **area**, in square centimetres?



- 19** A rectangle is 25 cm long and 4 cm wide. What is its **area**, in square centimetres?



- 20** A rectangle is 13 cm long and 10 cm wide. What is its **area**, in square centimetres?



- 21** A square has sides of 3 cm. What is its perimeter, in centimetres?
- 22** A square has sides of 5 cm. What is its perimeter, in centimetres?
- 23** A square has sides of 7 cm. What is its perimeter, in centimetres?
- 24** A square has sides of 9 cm. What is its perimeter, in centimetres?
- 25** A square has sides of 12 cm. What is its perimeter, in centimetres?
- 26** A square has sides of 6 cm. What is its perimeter, in centimetres?

- 27 A square has sides of 11 cm. What is its perimeter, in centimetres?
-
- 28 A square has sides of 8 cm. What is its perimeter, in centimetres?
-
- 29 A square has sides of 3 cm. What is its area, in square centimetres?
-
- 30 A square has sides of 5 cm. What is its area, in square centimetres?
-
- 31 A square has sides of 7 cm. What is its area, in square centimetres?
-
- 32 A square has sides of 9 cm. What is its area, in square centimetres?
-
- 33 A square has sides of 12 cm. What is its area, in square centimetres?
-
- 34 A square has sides of 6 cm. What is its area, in square centimetres?
-
- 35 A square has sides of 11 cm. What is its area, in square centimetres?
-
- 36 A square has sides of 8 cm. What is its area, in square centimetres?
-
- 37 A rectangle has area 48 cm^2 and length 8 cm. What is its width, in centimetres?
-
- 38 A rectangle has area 72 cm^2 and length 9 cm. What is its width, in centimetres?
-
- 39 A rectangle has area 90 cm^2 and length 15 cm. What is its width, in centimetres?
-
- 40 A rectangle has area 56 cm^2 and length 8 cm. What is its width, in centimetres?
-
- 41 A rectangle has area 120 cm^2 and length 12 cm. What is its width, in centimetres?
-
- 42 A rectangle has area 84 cm^2 and length 12 cm. What is its width, in centimetres?
-

B · Reasoning — What the units mean, and what congruent really says.

- 43 What is the difference between perimeter and area?
- ☐ There is none
 - ☐ Perimeter is the distance round the edge; area is the space inside
 - ☐ Area is the distance round the edge
 - ☐ Perimeter is always bigger
- 44 Why is area measured in square centimetres?
- ☐ Because shapes are square
 - ☐ Because it counts how many 1 cm by 1 cm squares fit inside
 - ☐ Because of the formula
 - ☐ It is just a name

- 45** Two rectangles both have area 24 cm^2 . Must they be the same shape?
- ☐ Yes
 - ☐ No — 6 by 4 and 12 by 2 both give 24
 - ☐ Only if they are squares
 - ☐ There is not enough information
- 46** Two shapes are **congruent**. That means ...
- ☐ they have the same area
 - ☐ corresponding sides and angles are equal
 - ☐ they are both rectangles
 - ☐ one is bigger than the other
- 47** If two rectangles are congruent, do they have the same perimeter?
- ☐ Yes
 - ☐ No
- 48** If two rectangles have the same perimeter, must they be congruent?
- ☐ Yes
 - ☐ No
- 49** What does a square have that a rectangle in general does **not**?
- ☐ four right angles
 - ☐ all four sides equal
 - ☐ two pairs of parallel sides
 - ☐ opposite sides equal
- 50** The perimeter of a rectangle is $2(l + w)$. Why not $2l + w$?
- ☐ It is a typo
 - ☐ There are two lengths and two widths
 - ☐ Because l is bigger
 - ☐ $2l + w$ also works
- 51** A rectangle has area 36 cm^2 . Which pair of sides is impossible?
- ☐ 6 and 6
 - ☐ 9 and 4
 - ☐ 12 and 3
 - ☐ 8 and 5
- 52** Does doubling both sides of a rectangle double its area?
- ☐ Yes
 - ☐ No

C · Challenge — Working backwards, and counting the possibilities.

- 53** A rectangle has perimeter 30 cm and length 9 cm. What is its width, in centimetres?
-
- 54** A rectangle has perimeter 44 cm and width 8 cm. What is its area, in square centimetres?
-
- 55** A square has area 49 cm^2 . What is its perimeter, in centimetres?
-

- 56** A square has perimeter 36 cm. What is its area, in square centimetres?

- 57** A rectangle 12 cm by 5 cm is cut into two congruent rectangles by one straight cut across the length. What is the area of each piece, in square centimetres?

- 58** How many rectangles with whole-number sides have an area of 24 cm^2 , if 6 by 4 and 4 by 6 count as the same one?

- 59** A rectangle has length 3 times its width and a perimeter of 32 cm. What is its area, in square centimetres?

D · Word problems — Gardens, carpets, pitches and paths.

- 60** A garden is 14 m long and 9 m wide. How many metres of fencing are needed to go all the way round?

- 61** A rectangular room is 5 m by 4 m. How many square metres of carpet are needed?

- 62** A football pitch is 100 m by 64 m. What is its area, in square metres?

- 63** A picture frame is 30 cm by 20 cm. What length of wood, in centimetres, goes round it?

- 64** A wall is 6 m by 3 m. Paint covers 9 m^2 per tin. How many tins are needed?

- 65** A rectangular field is 80 m long and has an area of 3600 m^2 . How wide is it, in metres?

- 66** Tiles are 20 cm squares. How many are needed to cover a floor 2 m by 3 m?

- 67** A path 1 m wide runs round the outside of a square lawn of side 10 m. What is the area of the whole square including the path, in square metres?
