



- 1 Ben wants to work out the perimeter of a square with sides of length 6 cm.

Ben writes:

$$\text{perimeter} = 6 \times 6 = 36 \text{ cm}$$

Explain the mistake Ben has made.

(2 marks)

Multiplying 6×6 gives the area of the square (in cm^2), not the perimeter

The perimeter is the total distance around the square

$$4 \times 6 = 24 \text{ cm}$$

2

- a. A regular hexagon has sides of 7 cm. Work out its perimeter.
b. A regular pentagon has a perimeter of 45 cm. Work out the length of one side.
c. Work out the perimeter of the quadrilateral in the diagram.

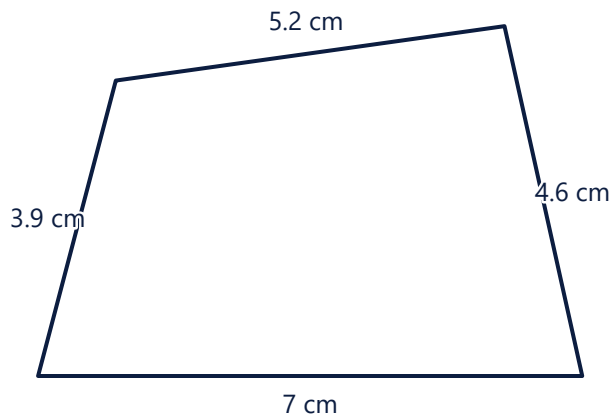


Diagram NOT accurately drawn

(3 marks)

a) 6 equal sides

$$6 \times 7 = 42$$

42 cm

b) 5 equal sides

$$45 \div 5 = 9$$

9 cm

c) Add all the sides

$$7 + 4.6 + 5.2 + 3.9 = 20.7$$

20.7 cm

3

An L-shape is made by joining a rectangle 8 cm by 5 cm to a rectangle 4 cm by 3 cm. The two rectangles do not overlap.

Work out the total area of the L-shape.

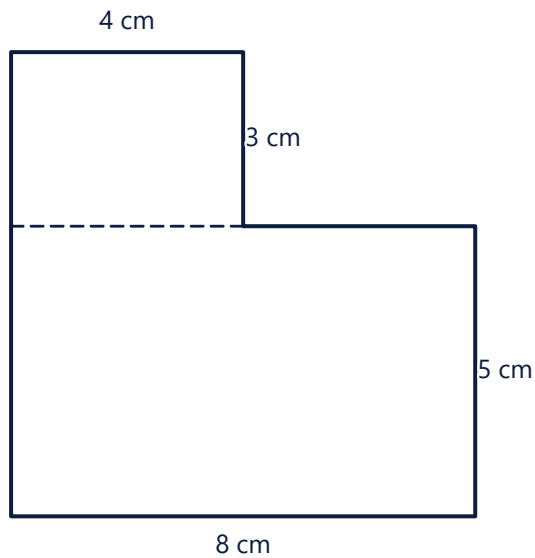


Diagram NOT accurately drawn

(2 marks)

$$\text{Area of the first rectangle} = 8 \times 5 = 40 \text{ cm}^2$$

$$\text{Area of the second rectangle} = 4 \times 3 = 12 \text{ cm}^2$$

$$\text{Total area} = 40 + 12 = 52 \text{ cm}^2$$

$$\boxed{52 \text{ cm}^2}$$

4

An L-shape is made by removing a rectangle 3 cm by 2 cm from one corner of a rectangle 8 cm by 6 cm.

Work out the perimeter of the L-shape.

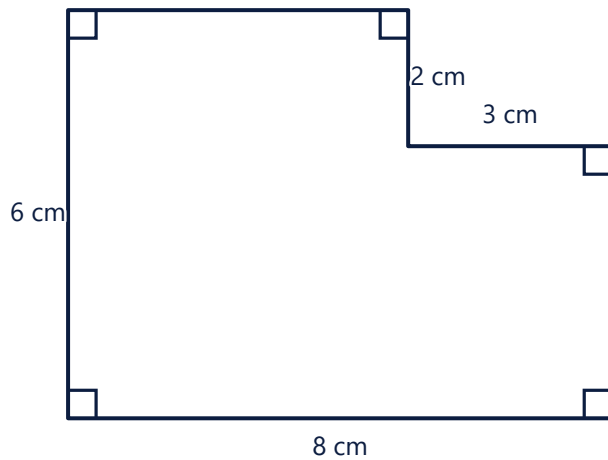


Diagram NOT accurately drawn

(3 marks)

The two cut edges of the removed corner are 3 cm and 2 cm long

The missing parts of the original sides are also 3 cm and 2 cm, so the total distance around the L-shape is the same as the perimeter of the full 8 cm by 6 cm rectangle

$$\text{Perimeter} = 8 + 6 + 3 + 2 + (8 - 3) + (6 - 2) = 8 + 6 + 3 + 2 + 5 + 4 \\ = 28 \text{ cm}$$

Check

$$2 \times (8 + 6) = 28 \text{ cm}$$

28 cm

5

A rectangle is 12 cm long and 9 cm wide.

A rectangle 5 cm by 4 cm is removed from one corner.

Work out the area of the remaining shape.

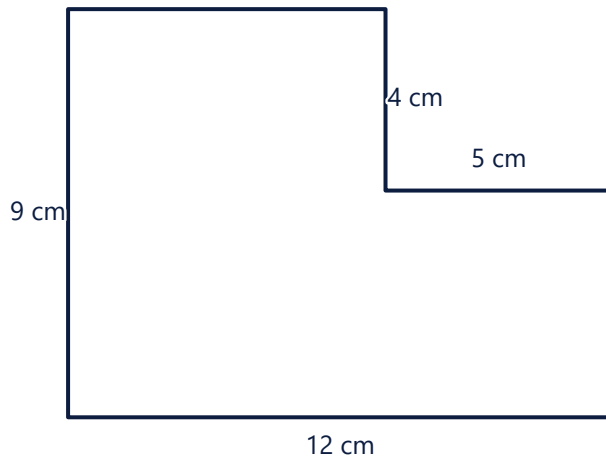


Diagram NOT accurately drawn

(3 marks)

$$\text{Area of the full rectangle} = 12 \times 9 = 108 \text{ cm}^2$$

$$\text{Area removed} = 5 \times 4 = 20 \text{ cm}^2$$

$$\text{Remaining area} = 108 - 20 = 88 \text{ cm}^2$$

$$\boxed{88 \text{ cm}^2}$$

6

The diagram shows a U-shape. All the corners are right angles.

- Work out the perimeter of the shape.
- Work out the area of the shape.

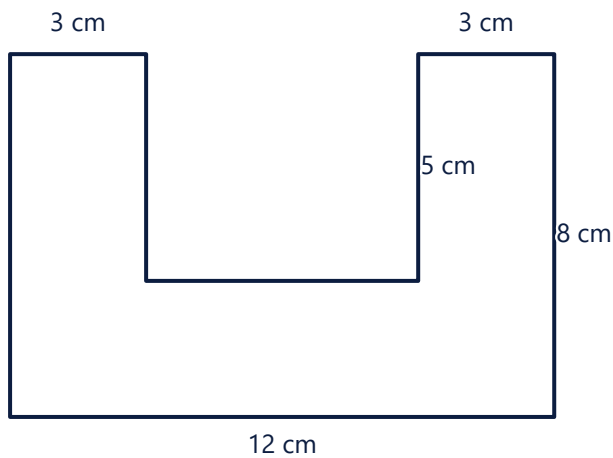


Diagram NOT accurately drawn

(4 marks)

a) Find the missing sides first

$$\text{Gap width} = 12 - 3 - 3 = 6$$

Left inner side = 5 (same as the right)

$$12 + 8 + 3 + 5 + 6 + 5 + 3 + 8 = 50$$

50 cm

b) Big rectangle take away the gap

$$12 \times 8 = 96$$

$$6 \times 5 = 30$$

$$96 - 30 = 66$$

66 cm²

7

A rectangle is made from three identical squares placed side by side in a row.

The perimeter of the rectangle is 48 cm.

Work out the area of the rectangle.

(3 marks)

Let each square have side s cm. The rectangle is $3s$ cm long and s cm wide

$$\text{Perimeter} = 2 \times (3s + s) = 8s, \text{ so } 8s = 48 \text{ and } s = 6$$

The rectangle is 18 cm by 6 cm, so its area = $18 \times 6 = 108 \text{ cm}^2$

108 cm²

8

A rectangular garden is 9 m long and 7 m wide.

A rectangular patio 4 m by 3 m is laid inside the garden. The rest of the garden is to be covered with grass seed.

One bag of grass seed covers 15 m^2 and costs £9.99.

Work out the total cost of the bags of grass seed needed.

(5 marks)

$$\text{Area of the garden} = 9 \times 7 = 63 \text{ m}^2$$

$$\text{Area of the patio} = 4 \times 3 = 12 \text{ m}^2$$

$$\text{Area to be seeded} = 63 - 12 = 51 \text{ m}^2$$

Bags needed

$$51 \div 15 = 3.4, \text{ so 4 bags must be bought}$$

$$\text{Total cost} = 4 \times £9.99 = £39.96$$

£39.96

9

A rectangular patio is 4.5 m long and 3.6 m wide.

The patio is to be covered completely with square paving slabs. Each slab has sides of length 0.9 m and costs £7.25.

Work out the total cost of the slabs needed. You may assume no slabs are cut.

(4 marks)

Slabs along the length

$$4.5 \div 0.9 = 5$$

Slabs along the width

$$3.6 \div 0.9 = 4$$

$$\text{Number of slabs} = 5 \times 4 = 20$$

$$\text{Total cost} = 20 \times £7.25 = £145$$

£145

10

Jamal is painting one wall of his bedroom. The wall is a rectangle 4 m wide and 2.5 m high. It has a window 1.5 m wide and 1.2 m high, which is not painted.

He gives the wall two coats of paint. One litre of paint covers 6 m^2 . Paint is sold in 2.5 litre tins costing £14 each.

Work out the cost of the paint Jamal needs to buy.

(4 marks)

$$\text{Wall: } 4 \times 2.5 = 10 \text{ m}^2$$

$$\text{Window: } 1.5 \times 1.2 = 1.8 \text{ m}^2$$

$$\text{To paint: } 10 - 1.8 = 8.2 \text{ m}^2$$

$$\text{Two coats: } 2 \times 8.2 = 16.4 \text{ m}^2$$

$$16.4 \div 6 = 2.73... \text{ litres}$$

1 tin = 2.5 litres is not enough, so 2 tins

$$2 \times £14 = £28$$

$$\boxed{£28}$$

11

A triangle has base $(x + 4) \text{ cm}$ and perpendicular height 6 cm.

The area of the triangle is 42 cm^2 .

a. Show that $3x + 12 = 42$.

b. Work out the value of x .

(4 marks)

$$\text{Area} = \frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2} \times (x + 4) \times 6 = 3(x + 4) = 3x + 12$$

$$\text{The area is } 42 \text{ cm}^2, \text{ so } 3x + 12 = 42$$

$$3x = 30, \text{ so } x = 10$$

Check

$$\text{base} = 14 \text{ cm}, \text{ area} = \frac{1}{2} \times 14 \times 6 = 42 \text{ cm}^2$$

12

A rectangle has length $(2x + 3)$ cm and width x cm.

The perimeter of the rectangle is 36 cm.

- Show that $6x + 6 = 36$
- Work out the area of the rectangle.

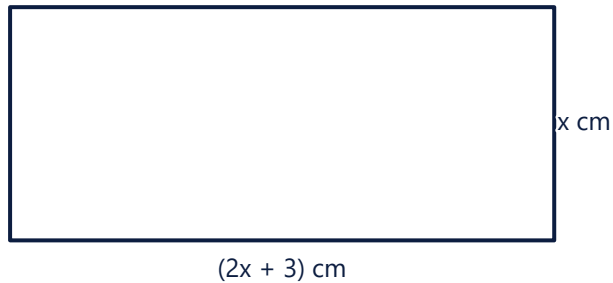


Diagram NOT accurately drawn

(4 marks)

a) Add all four sides

$$2x + 3 + x + 2x + 3 + x$$

$$= 6x + 6$$

$$6x + 6 = 36$$

b)

$$\begin{array}{rcl} 6x + 6 & = & 36 \\ - & & - \\ 6x & = & 30 \\ \div 6 & & \div 6 \\ x & = & 5 \end{array}$$

$$\text{Length} = 2 \times 5 + 3 = 13$$

$$\text{Width} = 5$$

$$\text{Area} = 13 \times 5 = 65$$

$$65 \text{ cm}^2$$