



- 1** 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.

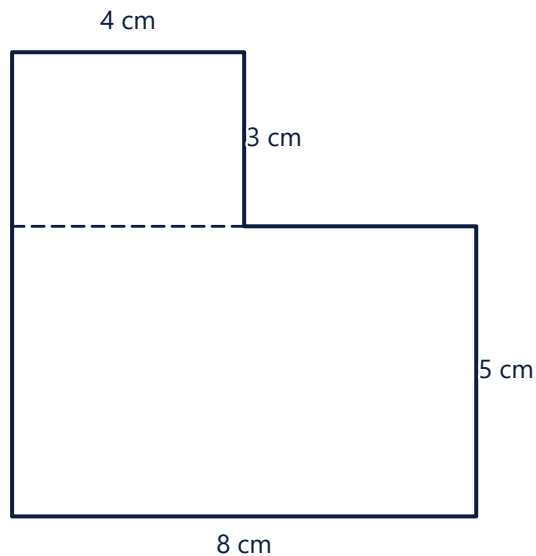


Diagram NOT accurately drawn

(2 marks)

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

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

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

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

2

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.

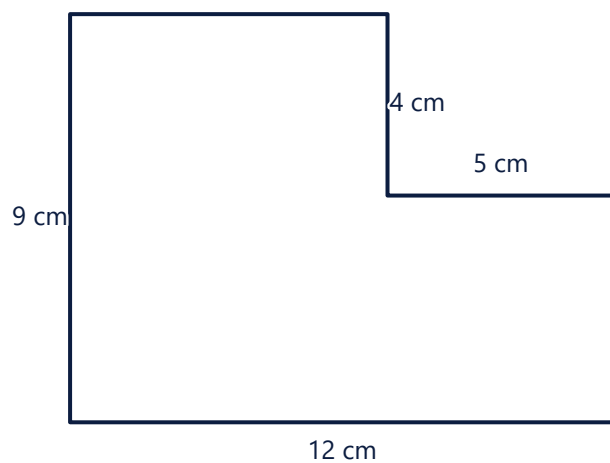


Diagram NOT accurately drawn

(3 marks)

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

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

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

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

3

A square of side 6 cm and a square of side 3 cm are joined to make a shape. The small square sits on top of the large square, with their left-hand edges in line.

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

(3 marks)

a)

$$\text{Left side} = 6 + 3 = 9$$

$$\text{Top of small square} = 3$$

$$\text{Right side of small square} = 3$$

$$\text{Exposed top of large square} = 6 - 3 = 3$$

$$\text{Right side of large square} = 6$$

$$\text{Bottom} = 6$$

$$9 + 3 + 3 + 3 + 6 + 6 = 30$$

$$\boxed{\text{Perimeter} = 30 \text{ cm}}$$

b)

$$\text{Large square: } 6 \times 6 = 36$$

$$\text{Small square: } 3 \times 3 = 9$$

$$36 + 9 = 45$$

$$\boxed{\text{Area} = 45 \text{ cm}^2}$$

4

The front of a shed is made from a rectangle with a triangle on top.

The rectangle is 10 cm wide and 6 cm high in a scale drawing. The triangle sits exactly on top of the rectangle, with base 10 cm and perpendicular height 4 cm.

Work out the total area of the scale drawing.

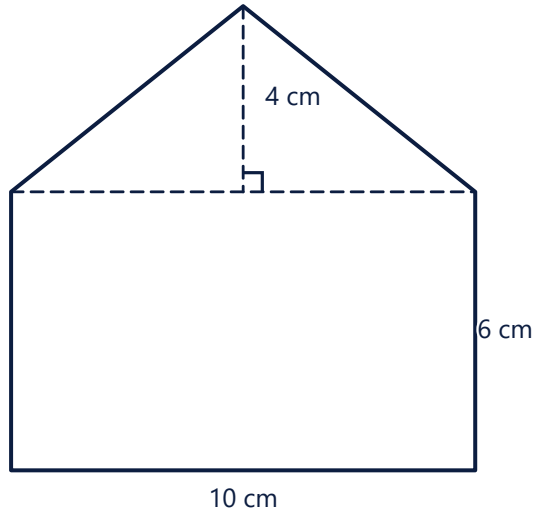


Diagram NOT accurately drawn

(4 marks)

$$\text{Area of the rectangle} = 10 \times 6 = 60 \text{ cm}^2$$

$$\text{Area of the triangle} = \frac{1}{2} \times 10 \times 4 = 20 \text{ cm}^2$$

$$\text{Total area} = 60 + 20 = 80 \text{ cm}^2$$

$$\boxed{80 \text{ cm}^2}$$

5

A T-shape is made from two rectangles. The top bar is 12 cm long and 3 cm wide. The stem is 4 cm wide and 6 cm long. It is joined to the middle of the lower edge of the bar and hangs straight down.

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

(4 marks)

a)

Bar sticks out each side: $(12 - 4) \div 2 = 4$

$$12 + 3 + 4 + 6 + 4 + 6 + 4 + 3 = 42$$

$$\text{Perimeter} = 42 \text{ cm}$$

b)

$$\text{Bar: } 12 \times 3 = 36$$

$$\text{Stem: } 4 \times 6 = 24$$

$$36 + 24 = 60$$

$$\text{Area} = 60 \text{ cm}^2$$

6

A flower bed is a square of side 8 m. A quarter circle of radius 3 m is cut out of one corner and paved. The rest of the square is planted with grass.

Work out the area of grass. Give your answer correct to 1 decimal place.

(3 marks)

$$\text{Square: } 8 \times 8 = 64$$

$$\text{Quarter circle: } \frac{1}{4} \times \pi \times 3^2$$

$$= \frac{1}{4} \times \pi \times 9 = 7.0686\dots$$

$$64 - 7.0686 = 56.93$$

$$56.9 \text{ m}^2$$

7

ABCD is a trapezium with AB parallel to DC. Angle A and angle D are both 90° . AB = 9 cm, DC = 15 cm and BC = 10 cm. The area of the trapezium is 96 cm^2 .

- Work out the length AD.
- Work out the perimeter of ABCD.

(3 marks)

a)

$$\begin{array}{rcl} \frac{1}{2} \times (9 + 15) \times AD & = & 96 \\ 12 \times AD & = & 96 \\ AD & = & 8 \end{array} \quad \begin{array}{l} \div 12 \\ \div 12 \end{array}$$

$$AD = 8 \text{ cm}$$

b)

$$9 + 8 + 15 + 10 = 42$$

$$42 \text{ cm}$$

8

Two identical squares, each with sides of length 6 cm, overlap. The overlapping region is a square with sides of length 2 cm. Work out the total area covered by the two squares.

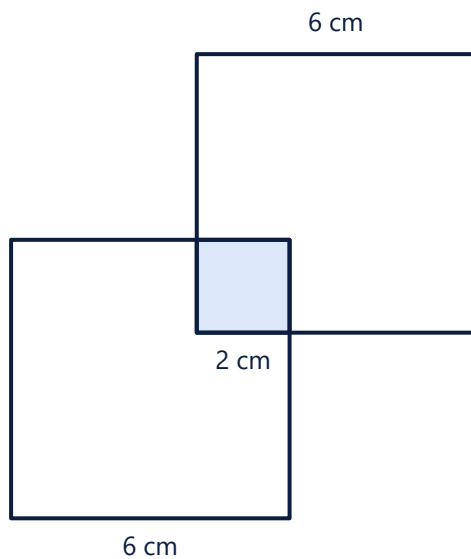


Diagram NOT accurately drawn

(4 marks)

$$\text{Area of each square} = 6 \times 6 = 36 \text{ cm}^2$$

$$\text{The two squares together, counting the overlap twice, cover } 36 + 36 = 72 \text{ cm}^2$$

The overlap, area $2 \times 2 = 4 \text{ cm}^2$, has been counted twice, so subtract it once

$$\text{Total area covered} = 72 - 4 = 68 \text{ cm}^2$$

$$\boxed{68 \text{ cm}^2}$$

9

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.

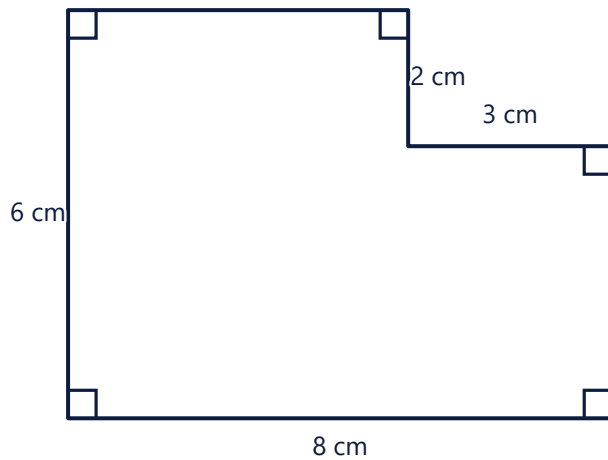


Diagram NOT accurately drawn

(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

10

Square P has side 10 cm. Square Q has side 7 cm. The squares overlap so that they share a 4 cm by 4 cm square.

- Work out the area of the part of square Q that is outside square P.
- Work out the total area covered by the two squares together.

(3 marks)

a)

$$Q = 7 \times 7 = 49$$

$$\text{Overlap} = 4 \times 4 = 16$$

$$49 - 16 = 33$$

$$33 \text{ cm}^2$$

b)

$$P = 10 \times 10 = 100$$

Count the overlap only once

$$100 + 33 = 133$$

$$133 \text{ cm}^2$$

11

A window is a rectangle with a semicircle on top. The rectangle is 1.2 m wide and 1.5 m high. The diameter of the semicircle is the 1.2 m width of the rectangle.

Glass costs £40 per m^2 .

- Work out the area of the window. Give your answer correct to 2 decimal places.
- Work out the cost of the glass, to the nearest pound.

(4 marks)

a)

$$\text{Rectangle: } 1.2 \times 1.5 = 1.8$$

$$\text{Radius} = 1.2 \div 2 = 0.6$$

$$\text{Semicircle: } \frac{1}{2} \times \pi \times 0.6^2 = 0.5655$$

$$1.8 + 0.5655 = 2.3655$$

$$2.37 \text{ m}^2$$

b)

$$2.3655 \times 40 = 94.62$$

$$£95$$

12

The end wall of a loft is a trapezium. The parallel sides are 5.2 m and 3.4 m long and they are 2.5 m apart. Isabel will cover the wall with cladding. Each pack covers 2 m² and costs £14.50.

- Work out the area of the wall.
- How many packs must Isabel buy, and what will they cost?
- Write down one assumption you made in part (b).

(4 marks)

a)

$$= \frac{1}{2} \times (5.2 + 3.4) \times 2.5$$

$$4.3 \times 2.5 = 10.75$$

$$10.75 \text{ m}^2$$

b)

$$10.75 \div 2 = 5.375$$

Round UP to whole packs

$$6 \times 14.50 = 87$$

$$6 \text{ packs, } £87$$

c)

No cladding is wasted when cutting

- 13 The diagram shows the floor of a workshop. The floor is an L-shape made from a rectangle 7 m by 4 m joined to a rectangle 3 m by 2 m.

Marco is going to paint the whole floor. One tin of floor paint covers 8 m^2 and costs £22.

Work out the total cost of the tins of paint Marco needs to buy.

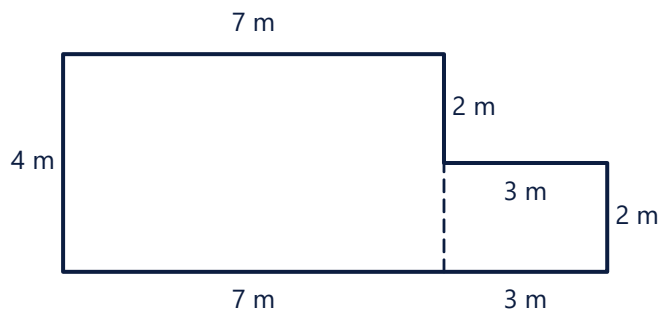


Diagram NOT accurately drawn

(5 marks)

$$\text{Area of the floor} = 7 \times 4 + 3 \times 2 = 28 + 6 = 34 \text{ m}^2$$

Tins needed

$$34 \div 8 = 4.25, \text{ so Marco must buy 5 tins}$$

$$\text{Total cost} = 5 \times £22 = £110$$

£110

- 14 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

15

A field is made from a rectangle 60 m by 40 m joined along one 40 m side to a right-angled triangle. The triangle has base 40 m and perpendicular height 30 m.

Fertiliser for the field costs 5p per square metre.

Work out the total cost of the fertiliser. Give your answer in pounds.

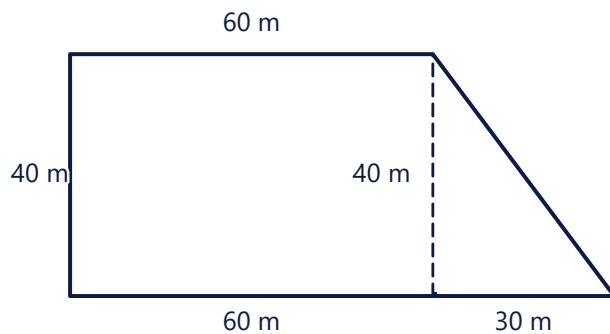


Diagram NOT accurately drawn

(5 marks)

$$\text{Area of the rectangle} = 60 \times 40 = 2400 \text{ m}^2$$

$$\text{Area of the triangle} = \frac{1}{2} \times 40 \times 30 = 600 \text{ m}^2$$

$$\text{Total area} = 2400 + 600 = 3000 \text{ m}^2$$

$$\text{Cost} = 3000 \times 5\text{p} = 15000\text{p} = \text{£}150$$

£150

16

Two identical squares are cut from a rectangular sheet of card 14 cm long and 10 cm wide. The squares do not overlap.

The area of the card remaining is 90 cm^2 .

Work out the side length of each square.

(5 marks)

$$\text{Area of the sheet} = 14 \times 10 = 140 \text{ cm}^2$$

$$\text{Area removed} = 140 - 90 = 50 \text{ cm}^2$$

$$\text{Each square has area } 50 \div 2 = 25 \text{ cm}^2$$

$$\text{Side length} = \sqrt{25} = 5 \text{ cm}$$

5 cm

17

The end wall of a barn is a trapezium. The parallel sides of the trapezium are 6 m and 8 m long, and the perpendicular distance between them is 3 m.

Priya is going to paint the wall. One tin of paint covers 5 m² and costs £13.50.

Work out the total cost of the tins of paint Priya needs to buy.

(5 marks)

$$\text{Area of the trapezium} = \frac{1}{2} \times (6 + 8) \times 3 = \frac{1}{2} \times 14 \times 3 = 21 \text{ m}^2$$

Tins needed

$$21 \div 5 = 4.2, \text{ so Priya must buy 5 tins (she cannot buy part of a tin)}$$

$$\text{Total cost} = 5 \times £13.50 = £67.50$$

£67.50