



- 1 A parallelogram has a base of 9 cm and a perpendicular height of 6 cm.

Work out the area of the parallelogram.

(2 marks)

Area = base $\times$ perpendicular height

$$9 \times 6 = 54$$

$$\boxed{54 \text{ cm}^2}$$

- 2 A triangle has a base of 12 cm and a perpendicular height of 7 cm.

Work out the area of the triangle.

(2 marks)

Area = $\frac{1}{2} \times$ base $\times$ height

$$\frac{1}{2} \times 12 \times 7$$

$$6 \times 7 = 42$$

$$\boxed{42 \text{ cm}^2}$$

- 3 A rectangle has length 9 cm and width 4 cm.

a. Work out the area of the rectangle.

b. Work out the perimeter of the rectangle.

(2 marks)

Perimeter is the total distance around the boundary. Area counts the unit squares inside the shape, so its units are squared

$$\text{Area} = \text{length} \times \text{width} = 9 \times 4 = 36 \text{ cm}^2$$

$$\text{Perimeter} = 2 \times (9 + 4) = 2 \times 13 = 26 \text{ cm}$$

- 4 A triangle has base 12 cm and perpendicular height 5 cm.

Work out the area of the triangle.

(2 marks)

Two identical copies of a triangle make a parallelogram with the same base and perpendicular height. The triangle has half that area

$$\text{Area of a triangle} = \frac{1}{2} \times \text{base} \times \text{perpendicular height}$$

$$\text{Area} = \frac{1}{2} \times 12 \times 5 = 30 \text{ cm}^2$$

$$\boxed{30 \text{ cm}^2}$$

5

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

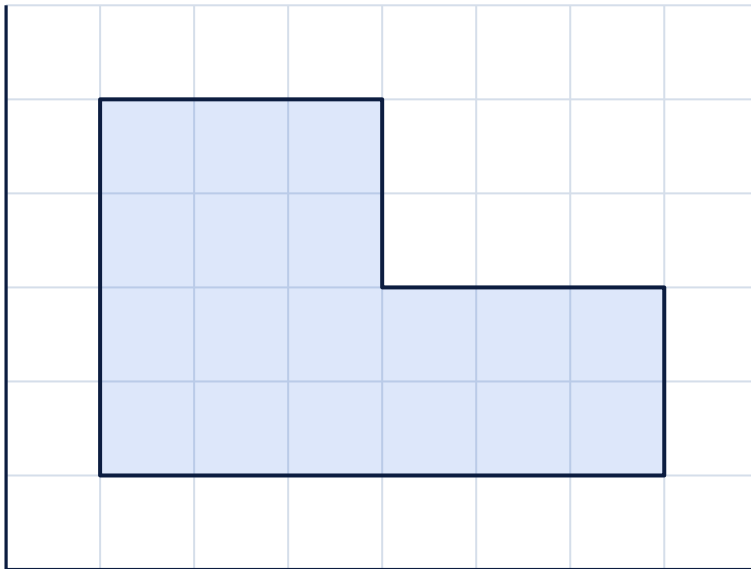
$$4 \times 6 = 24 \text{ cm}$$

6

The diagram shows a shape drawn on a centimetre square grid. Each square has sides of 1 cm.

a. Work out the area of the shape.

b. Work out the perimeter of the shape.



(3 marks)

a) Count squares: split into two rectangles

$$\text{bottom: } 6 \times 2 = 12$$

$$\text{top: } 3 \times 2 = 6$$

$$12 + 6 = 18$$

b) Add up every outside edge

$$6 + 2 + 3 + 2 + 3 + 4 = 20$$

$$\boxed{\text{a) } 18 \text{ cm}^2 \text{ b) } 20 \text{ cm}}$$

- 7 A square has an area of 81 cm^2 .
An equilateral triangle has the same perimeter as the square.
Work out the length of one side of the triangle.

(3 marks)

$$\text{Square side} = \sqrt{81} = 9 \text{ cm}$$

$$\text{Perimeter} = 4 \times 9 = 36 \text{ cm}$$

Triangle has 3 equal sides

$$36 \div 3 = 12$$

12 cm

- 8 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.

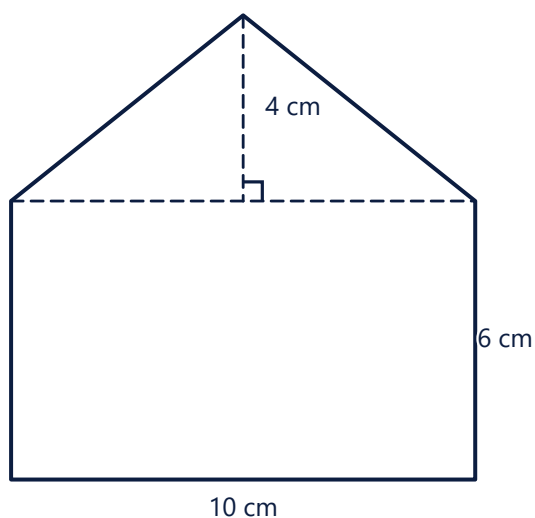


Diagram NOT accurately drawn

(4 marks)

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

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

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

80 cm²

- 9 A parallelogram has an area of 72 cm^2 .

Its base is 12 cm .

Work out the perpendicular height of the parallelogram.

(3 marks)

Area = base $\times$ height

$$\begin{array}{rcl} 72 & = & 12 \times h \\ \div 12 & & \div 12 \\ 6 & = & h \end{array}$$

6 cm

- 10 A triangle has an area of 30 cm^2 .

Its base is 12 cm .

Work out the perpendicular height of the triangle.

(3 marks)

$$\begin{array}{rcl} 30 & = & \frac{1}{2} \times 12 \times h \\ 30 & = & 6h \\ \div 6 & & \div 6 \\ 5 & = & h \end{array}$$

5 cm

- 11 Rectangle A has length 12 cm and width 5 cm .

Rectangle B has width 4 cm . The perimeter of rectangle B is equal to the perimeter of rectangle A .

Work out the area of rectangle B .

(4 marks)

$$\text{Perimeter of } A = 2 \times (12 + 5) = 34 \text{ cm}$$

For rectangle B

$$2 \times (\text{Length} + 4) = 34, \text{ so } \text{Length} + 4 = 17 \text{ and } \text{Length} = 13 \text{ cm}$$

$$\text{Area of } B = 13 \times 4 = 52 \text{ cm}^2$$

52 cm²

- 12 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

$$3.6 \div 0.9 = 4$$

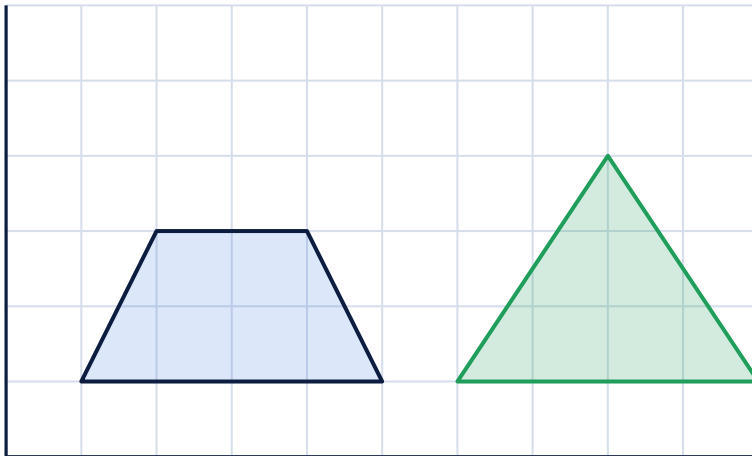
$$\text{Number of slabs} = 5 \times 4 = 20$$

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

£145

- 13 The diagram shows a trapezium drawn on a centimetre square grid. Each square has sides of 1 cm.

On the grid, draw a triangle that has the same area as the trapezium. The corners of your triangle must be on grid points.



(3 marks)

Area of the trapezium

$$\frac{1}{2} \times (4 + 2) \times 2 = 6$$

Triangle needs base $\times$ height = 12

$$\text{base } 4, \text{ height } 3: \frac{1}{2} \times 4 \times 3 = 6$$

Draw base 4 squares wide, apex 3 squares above it

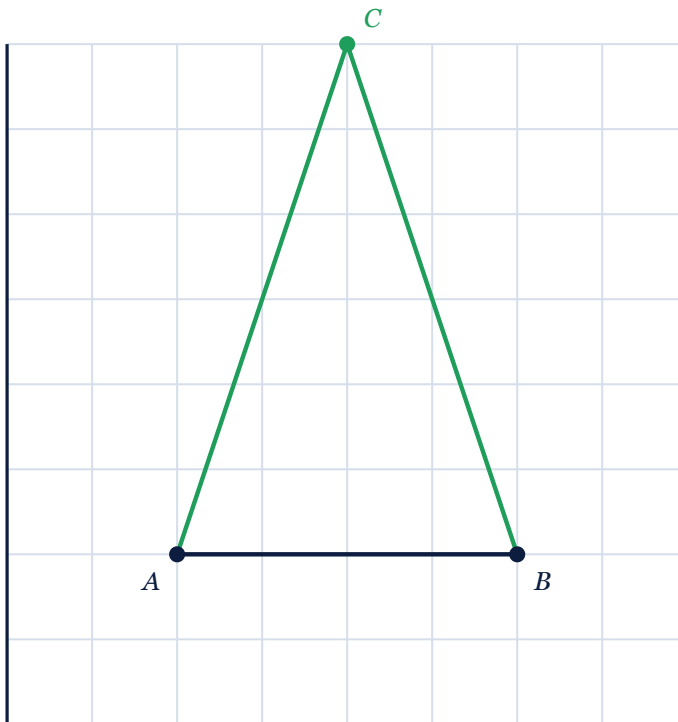
Any triangle of area 6 cm^2 (for example base 4, height 3)

14

The diagram shows the line AB on a centimetre square grid. Each square has sides of 1 cm.

AB is the base of triangle ABC . The area of triangle ABC is 12 cm^2 .

On the grid, mark the point C and complete the triangle ABC .



(2 marks)

AB is 4 squares long

$$\frac{1}{2} \times 4 \times h = 12$$

$$2h = 12$$

$$h = 6$$

C is 6 squares directly above the line AB

C is 6 cm above AB , e.g. (4, 8)

15

A square has an area of 64 cm^2 .

A rectangle has the same perimeter as the square.

The width of the rectangle is 5 cm.

Work out the area of the rectangle.

(4 marks)

$$\text{Side} = \sqrt{64} = 8$$

$$\text{Perimeter} = 4 \times 8 = 32$$

$$\text{Length} + \text{width} = 32 \div 2 = 16$$

$$\text{Length} = 16 - 5 = 11$$

$$\text{Area} = 11 \times 5 = 55$$

$$\boxed{55 \text{ cm}^2}$$

16

A triangle has base $(x + 4)$ 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

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

17

Layla is paving a rectangular patio 6 m long and 4 m wide.

Each paving slab is a square of side 50 cm and costs £3.80.

Layla has a budget of £400.

Does she have enough money? You must show your working.

(4 marks)

$$\text{Patio: } 6 \times 4 = 24 \text{ m}^2$$

$$\text{Slab: } 0.5 \times 0.5 = 0.25 \text{ m}^2$$

$$24 \div 0.25 = 96 \text{ slabs}$$

$$96 \times £3.80 = £364.80$$

$$\boxed{\text{Yes, } £364.80 \text{ is less than } £400}$$

18

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

19

An isosceles trapezium has parallel sides of 4 cm and 16 cm.

Its two sloping sides are each 10 cm long.

Its area is 80 cm².

a. Work out the perpendicular height of the trapezium.

b. Work out the perimeter of the trapezium.

(4 marks)

a)

$$80 = \frac{1}{2} \times (4 + 16) \times h$$

$$80 = 10h$$

÷10

$$8 = h$$

÷10

8 cm

b)

$$4 + 16 + 10 + 10 = 40$$

40 cm

- 20 Rectangle P has length 20 cm and width x cm.
Square Q has sides of length 8 cm.
The area of rectangle P is twice the area of square Q .
Work out the perimeter of rectangle P .

(5 marks)

$$\text{Area of } Q = 8 \times 8 = 64 \text{ cm}^2$$

$$\text{Area of } P = 2 \times 64 = 128 \text{ cm}^2$$

$$20x = 128, \text{ so } x = 6.4 \text{ cm}$$

$$\text{Perimeter of } P = 2 \times (20 + 6.4) = 2 \times 26.4 = 52.8 \text{ cm}$$

$$\boxed{52.8 \text{ cm}}$$

- 21 A row of 6 identical square tiles has a length of 90 cm.
A wall is 2.4 m wide and 1.5 m high.
Tiles are used to cover the whole wall with no gaps.
How many tiles are needed?

(4 marks)

$$\text{Tile side: } 90 \div 6 = 15 \text{ cm}$$

$$\text{Wall: } 240 \text{ cm by } 150 \text{ cm}$$

$$240 \div 15 = 16$$

$$150 \div 15 = 10$$

$$16 \times 10 = 160$$

$$\boxed{160 \text{ tiles}}$$

Jade is tiling a wall in the shape of a trapezium. The parallel sides of the wall are 3 m and 5 m long, and the perpendicular distance between them is 2.4 m.

Each tile is a square with sides of length 30 cm. Tiles are sold in packs of 12. Each pack costs £18.

- Work out the total cost of the packs of tiles Jade needs to buy. You may assume no tiles are wasted.
- Jade decides to allow 10% extra tiles for cutting and breakage. Does this change the number of packs she needs to buy? You must show your working.

(7 marks)

$$\text{Area of the wall} = \frac{1}{2} \times (3 + 5) \times 2.4 = \frac{1}{2} \times 8 \times 2.4 = 9.6 \text{ m}^2$$

$$\text{Each tile is } 0.3 \text{ m} \times 0.3 \text{ m} = 0.09 \text{ m}^2$$

Tiles needed

$$9.6 \div 0.09 = 106.66\dots, \text{ so } 107 \text{ tiles}$$

Packs needed

$$107 \div 12 = 8.91\dots, \text{ so } 9 \text{ packs. Cost} = 9 \times £18 = £162$$

Allowing 10% extra

$$107 \times 1.1 = 117.7, \text{ so } 118 \text{ tiles are needed}$$

9 packs give only 108 tiles, so Jade now needs 10 packs. Yes, the number of packs changes