

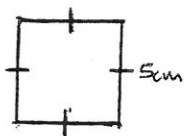
## Measurement 3

### Perimetre

This is the distance ~~outside~~ <sup>around</sup> the outside of a shape. Units are mm, cm, m, km.

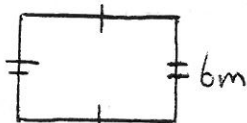
### Examples

1)



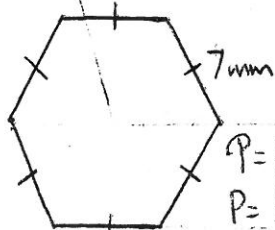
$$P = 5 + 5 + 5 + 5 \quad P = 20$$

2)



$$P = 20 + 20 + 6 + 6 = P = 52$$

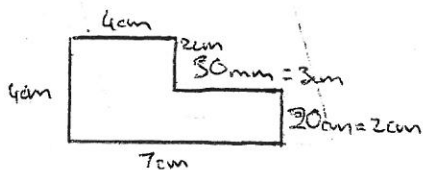
3)



$$P = 6 \times 7$$

$$P = 42 \text{ mm}$$

4)



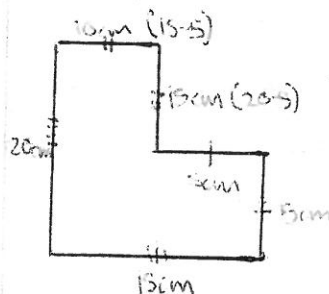
$$P = 4 + 4 + 2 + 3 + 2 + 7$$

$$P = 22 \text{ cm}$$

## Missing sides

Use the other sides to find the missing side, then find the perimeter

### Example



$$\text{Perimetre} = 20 + 10 + 15 + 5 + 5 + 15$$

$$P = 80 \text{ cm}$$

### Area

This is the amount of space a shape takes up. It is measured in  $\text{mm}^2$ ,  $\text{cm}^2$ ,  $\text{m}^2$ ,  $\text{km}^2$  or for farms hectares.

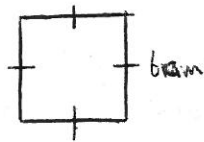
If the area of a shape is  $8 \text{ cm}^2$ , this means it takes up eight of



1 square cm

## Area formula

1) Square

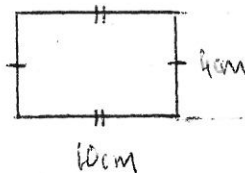


$$A = l^2$$

$$= b^2$$

$$A = 36^2 \text{ - must have}$$

2) Rectangle



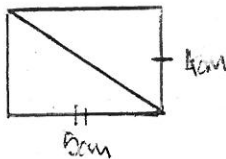
$$A = lb$$

$$A = 10 \times 4$$

$$A = 40 \text{ cm}^2$$

3) triangle

A triangle is half a rectangle

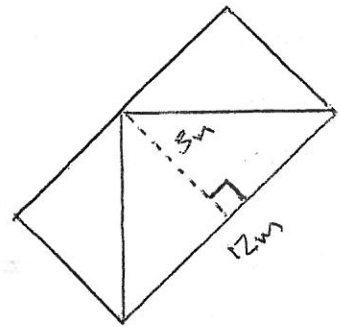


Area of red rectangle is half blue rectangle

$$A = \frac{1}{2} b \times h \text{ - height at}$$

$$A = \frac{1}{2} \times 5 \times 4 \text{ right angles}$$

$$A = 10 \text{ m}^2$$



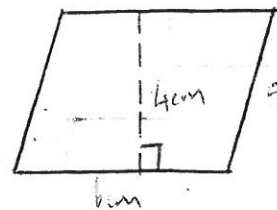
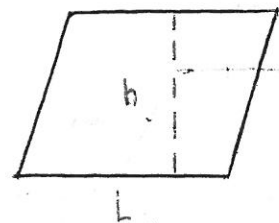
Area of red triangle is half blue rectangle

$$A = \frac{1}{2} \times 12 \times 3$$

$$A = 18 \text{ m}^2$$

## Parallelograms

Area = Length  $\times$  height



$$\text{Area} = 6 \times 4$$

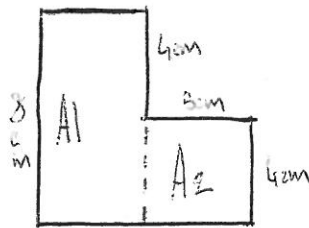
$$A = 24 \text{ cm}$$

## Composite area

Simple shapes added for su together

## A) adding Shape

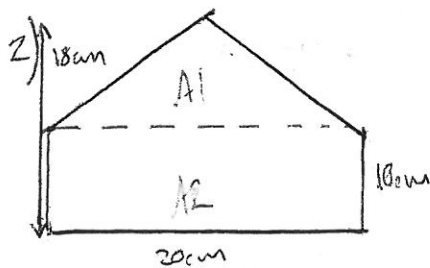
1)



$$A_1 = 5 \times 8 = 40 \text{ cm}^2$$

$$A_2 = 3 \times 4 = 12 \text{ cm}^2$$

$$A_{\text{total}} = 40 + 12 = 52 \text{ cm}^2$$



$$A_1 = \frac{1}{2} \times 20 \times 9$$

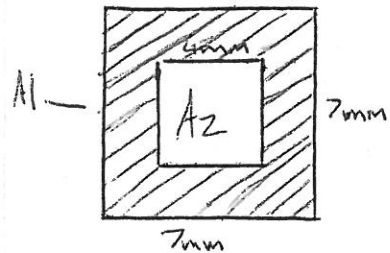
$$A_1 = 90 \text{ mm}^2$$

$$A_2 = 10 \times 20 = 200 \text{ mm}^2$$

$$A_{\text{total}} = 90 + 200 = 290 \text{ mm}^2$$

## Subtracting Shapes

find the shaded area

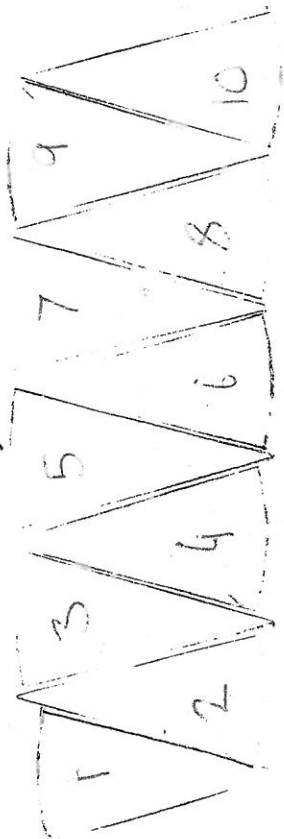


$$A_1 = 7 \times 7 = 49 \text{ mm}^2$$

$$A_2 = 4 \times 4 = 16 \text{ mm}^2$$

$$A_{\text{shaded}} = 49 - 16 = 33 \text{ mm}^2$$

Area of circle



area = length x height

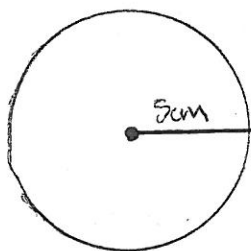
$$A = \pi \times r \times \text{radius}$$

$$A = \pi \times r^2$$

Examples

find the areas

1)



$$A = \pi \times 5^2$$

$$A = 78.5 \text{ cm}^2 \text{ (1dp)}$$

2)



$$A = \pi \times 5.5^2$$

$$A = 95.0 \text{ cm}^2$$

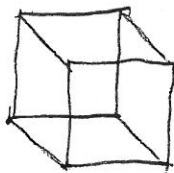
3)



$$A = \pi \times 4.5^2 \text{ circle}$$

$$A = \frac{\pi \times 4.5^2}{2}$$

$$= 31.8 \text{ cm}^2$$



## Circumference

This is the perimeter or distance around the outside of a circle

for any circle, the number of times its diameter will fit inside its circumference is about 3.14 (2.d.p)

This number is called pi and has symbol  $\pi$  we can use it to calculate the circumference of a circle

$$C = \pi \times d$$

Examples

1) if diameter is 6cm

$$C = \pi \times 6$$

$$C = 18.8 \text{ cm (1dp)}$$

2) if radius is 2.4m

$$C = \pi \times 4.8$$

$$C = 15.1 \text{ m}$$

## Volume

Volume is the amount of space a shape takes up.

Its measured in cubic units usually  $\text{cm}^3$ ,  $\text{mm}^3$ ,  $\text{m}^3$

If the volume of a shape is  $18\text{cm}^3$  then 18 little cubic centimetres

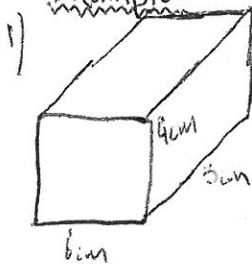
## Volume of cuboid

A cuboid has faces that are rectangles

$$V = \text{length} \times \text{breadth} \times \text{height}$$

$$V = L \times b \times h$$

### Examples

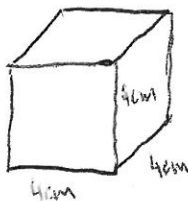


$$V = l \times b \times h$$

$$V = 6 \times 5 \times 4$$

$$V = 120\text{cm}^3$$

2)



Volume of cube

$$4 \times 4 \times 4$$

$$= 4^3$$

$$= 64\text{mm}^3$$

## Volume of Prism

A prism is a shape that can be sliced so that every slice is the shape & size

~~Prism~~

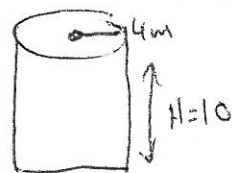
Volume of Prism	=	Area of face	$\times$	height
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### Examples



$$12 \times 3$$

$$V = 36\text{m}^2$$



$$\text{area face} = \pi \times 4^2$$

$$A = 50.27\text{m}^2 \text{ (2 d.p.)}$$

$$V = 50.27 \times 10$$

$$V = 502.7\text{m}^3$$

## Liquid volume

$$1 \text{ cm}^3 = 1 \text{ ml}$$

$$1000 \text{ cm}^3 = 1000 \text{ ml} \\ = 1 \text{ L}$$

## Examples

How many litres