

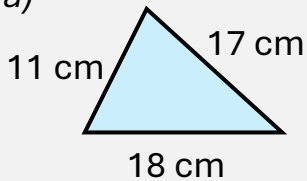


### perimeter...

The **perimeter** of a shape is the total distance around the outside of it.

*EXAMPLE: Calculate the perimeter of each shape.*

(a)

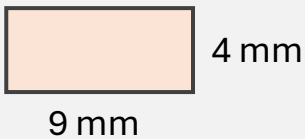


Add together all the side lengths

$$11 + 17 + 18 = 46 \text{ cm}$$

Remember to include the units

(b)

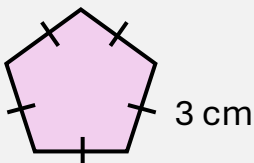


Calculate the missing sides

$$4 + 9 + 4 + 9 = 26 \text{ mm}$$

Include all four sides of the rectangle

(c)



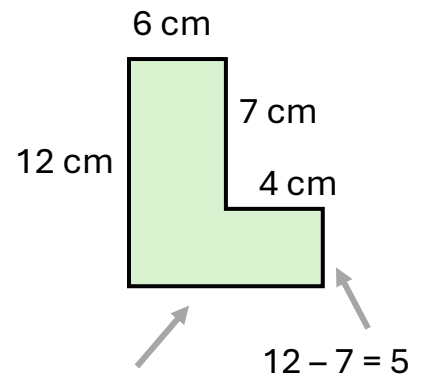
$$3 \times 5 = 15 \text{ cm}$$

The small lines on the diagram show that all the sides are the same length

### compound shapes...

*EXAMPLE:*

*Calculate the perimeter of this shape. (All angles are right angles.)*



$$6 + 4 = 10$$

Perimeter,

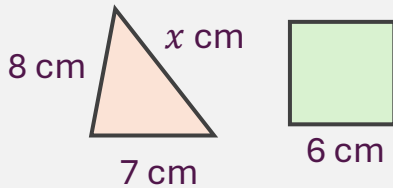
$$6 + 7 + 4 + 5 + 10 + 12 = 44 \text{ cm}$$

Add together all the side lengths

## two shapes...

**EXAMPLE:** The triangle and the square have the **same perimeter**.

Calculate  $x$ .



Square:  $6 \times 4 = 24$

Triangle:  $8 + 7 = 15$

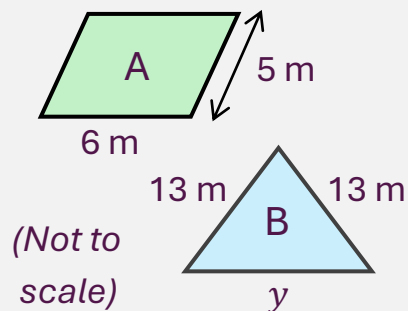
$24 - 15 = 9$

$x = 9$

Start by finding the perimeter of the square

They have the same perimeter, so the perimeter of the triangle is also 24

**EXAMPLE:** The perimeter of B is **double** the perimeter of A. Calculate the length  $y$ .



A:  $P = 6 + 5 + 6 + 5 = 22$

B:  $P = 22 \times 2 = 44$

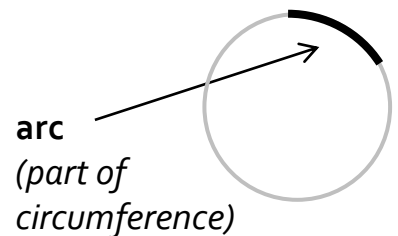
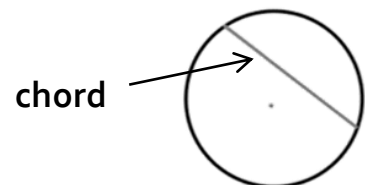
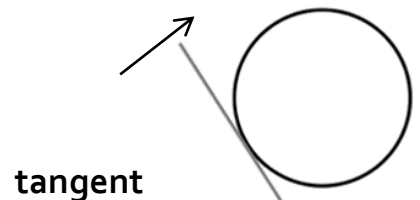
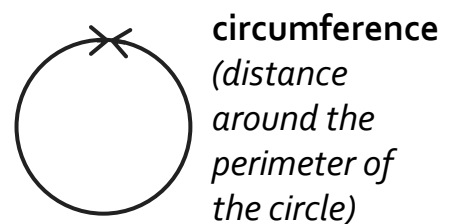
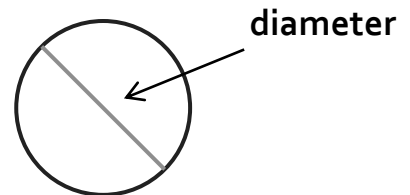
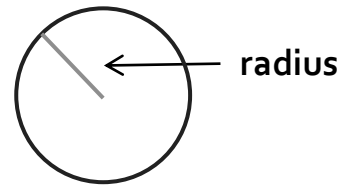
$13 + 13 = 26$

$44 - 26 = 18$  cm

Calculate the perimeter of A

The perimeter of B is double the perimeter of A

## circle parts...

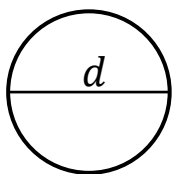


## circumference...

The circumference of a circle is calculated using the formula:

$$C = d \times \pi$$

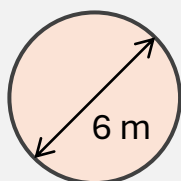
Remember that  $\pi$  (pi) is the special number 3.14.....



**EXAMPLE:** Calculate the circumference of each circle.

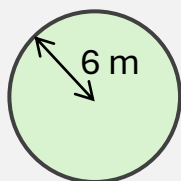
Give your answers correct to 1 decimal place.

(a)



$$\begin{aligned} C &= d \times \pi \\ &= 6 \times \pi \\ &= 18.84955592 \\ &= 18.8 \text{ m (1dp)} \end{aligned}$$

(b)



$$d = 6 \times 2 = 12$$

$$\begin{aligned} C &= d \times \pi \\ &= 12 \times \pi \\ &= 37.69911184 \\ &= 37.7 \text{ m (1dp)} \end{aligned}$$

“in terms of  $\pi$ ” just means ‘leave  $\pi$  in your answer’

This question doesn’t need a calculator

Use the  $\pi$  button on a scientific calculator

Write down the whole calculator display, before rounding

To work backwards, we need to **divide** by  $\pi$

The diagram shows the radius, so we double it to find the diameter

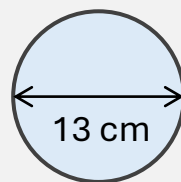
Halve the diameter to work out the radius

Use all the digits, to keep the answer accurate

## in terms of $\pi$ ...

**EXAMPLE:** Calculate the circumference of the circle.

Give your answer **in terms of  $\pi$** .



$$\begin{aligned} C &= d \times \pi \\ &= 13 \times \pi \\ &= 13\pi \text{ (cm)} \end{aligned}$$

## working backwards...

**EXAMPLE:** A circle has a circumference of 15 cm. Calculate its **radius**.

$$\begin{aligned} d &\rightarrow \times \pi \rightarrow C \\ d &\leftarrow \div \pi \leftarrow C \end{aligned}$$

$$d = \frac{C}{\pi}$$

$$\begin{aligned} &= 15 \div \pi \\ &= 4.774648293 \end{aligned}$$

$$\begin{aligned} r &= d \div 2 \\ &= 4.774648293 \div 2 \\ &= 2.387324146 \\ &= 2.4 \text{ cm (1dp)} \end{aligned}$$