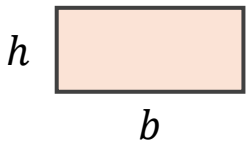
# Year 10 Maths

## Unit 6: Area

MATHOPEDIA

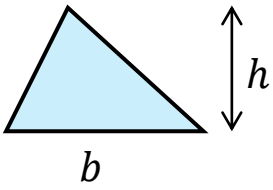
### area formulae...

**Rectangle**



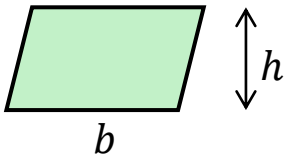

$$\text{Area} = b \times h$$

**Triangle**



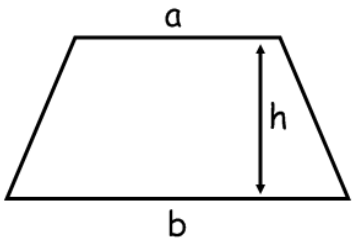

$$\text{Area} = \frac{b \times h}{2}$$

**Parallelogram**




$$\text{Area} = b \times h$$

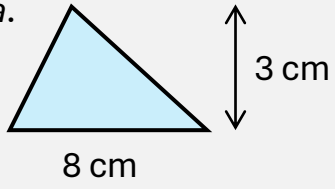
**Trapezium**




$$\text{Area} = \frac{1}{2}(a + b)\, h$$

### area of triangle...

*EXAMPLE: Calculate the area.*

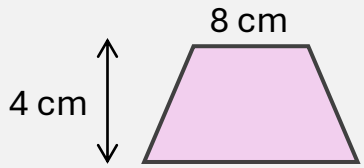



*Use the triangle formula on the left. Remember to halve it.*

$$\frac{8 \times 3}{2} = 12 \text{ cm}^2$$

### area of trapezium...

*EXAMPLE:*
*Calculate the area of the trapezium.*




*Start with the formula*

$$A = \frac{1}{2}(a + b)h$$

*Substitute the lengths from the diagram*

$$= \frac{1}{2} \times (8 + 13) \times 4$$

*Work out the brackets first*

$$= \frac{1}{2} \times 21 \times 4$$

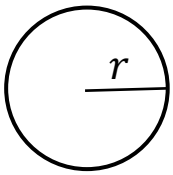
$$= \frac{1}{2} \times 84 = 42 \text{ cm}^2$$

*Remember to include the units*

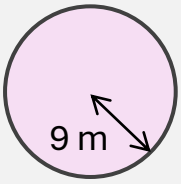
## area of a circle...

The area of a circle is calculated using the formula:

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




*EXAMPLE:*
*Calculate the **area** of the circle. Give your answer correct to 2 decimal places.*




*Substitute the radius of 9 into the formula*

*Write down the whole calculator display, before rounding*

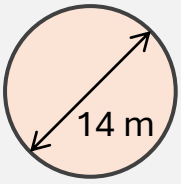
$A = \pi \times r^2$

$= \pi \times 9^2$

$= 254.4690049$

$= 254.47$ m² (2dp)

*EXAMPLE:*
*Calculate the area of the circle.*
*Give your answer in terms of π.*




*The radius is 14 ÷ 2 = 7*

$A = \pi \times r^2$

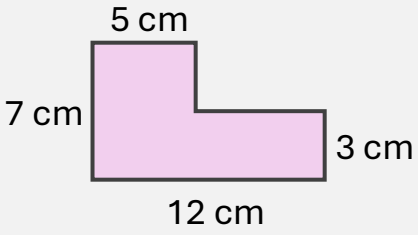
$= \pi \times 7^2$

$= 49\pi$ (m²)

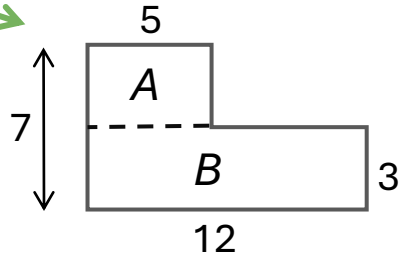
*Leave the answer 'in terms of π'*

## compound area...

*EXAMPLE:*
*Calculate the area.*

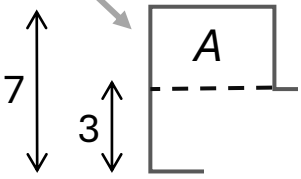



*Divide the shape into two rectangles*




*Calculate the missing height of rectangle A*

7 – 3 = 4




*Find the area of each rectangle*

Area A: 5 x 4 = 20

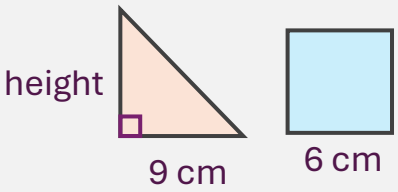
Area B: 12 x 3 = 36

*Add to get the total area*

Total area,
20 + 36 = 56 cm²

## two shapes...

*EXAMPLE: The triangle and the square have the same **area**. Calculate the height of the triangle.*




*Read carefully whether it's area, or perimeter*

*Decide what we can work out immediately*

Square area,

6 x 6 = **36**

*Use the fact that the triangle has the same area*

Triangle height,

$$\frac{9 \times h}{2} = \mathbf{36}$$

$$9 \times h = 72$$

$$h = 8 \text{ (cm)}$$