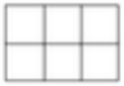
Y10 FOUNDATION HT2 AREA AND PERIMETER

Area problems

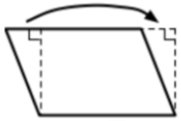
Rectangle

Base x Perpendicular height



Parallelogram/ Rhombus

Base x Perpendicular height



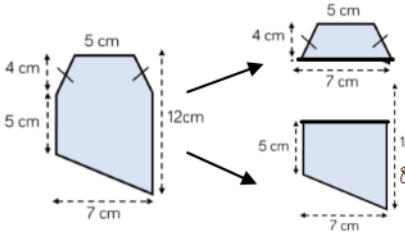
Triangle

½ x Base x Perpendicular height

A triangle is half the size of the rectangle it would fit in

Compound shapes

To find the area compound shapes often need splitting into more manageable shapes first. Identify the shapes and missing sides etc. first.



Units

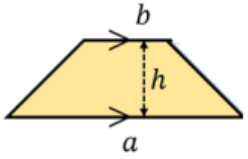
Shape A + Shape B = total area

$\frac{(5+7)\times 4}{2} + \frac{(5+8)\times 7}{2} = 24 + 45.5 = 69.5\text{cm}^2$

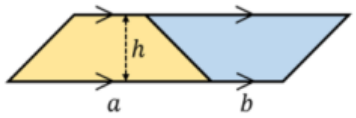
Area of a trapezium

Area of a trapezium

$\frac{(a+b)\times h}{2}$



Why?

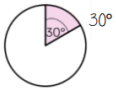


- Two congruent trapeziums make a parallelogram
- New length (a + b) x height
- Divide by 2 to find area of one

Fractional parts of a circle

A circle is made up of 360°

Formula to remember:
Area of a circle = πr^2
Circumference of a circle = πd or $2\pi r$



30° represents $\frac{30}{360}$ of a full circle

$\frac{30}{360} = \frac{1}{12}$

$\frac{270}{360}$ of a full circle (in degrees)

$\frac{6}{8}$ of a full circle (in equal parts)

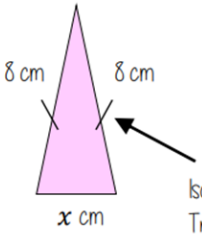
$\frac{3}{4}$ of a full circle

The fraction of the circle is as $\frac{\theta}{360}$

θ represents the degrees in the sector

Solve problems with perimeter

Perimeter is the length around the outside of a polygon



Isosceles Triangle notation

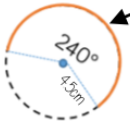
The triangle has a perimeter of 25cm
Find the length of x

8cm + 8cm + $x$cm = 25cm
16cm + $x$cm = 25cm
$x$cm = 9cm

Arc length

Remember an arc is part of the circumference

Circumference of the whole circle = $\pi d = \pi \times 9 = 9\pi$



Arc length = $\frac{\theta}{360} \times$ circumference

$= \frac{240}{360} \times 9\pi$

$= \frac{2}{3} \times 9\pi = 6\pi$

Perimeter

Perimeter is the length around the outside of the shape

This includes the arc length and the radii that encloses the shape

Perimeter = $\frac{\theta}{360} \times$ circumference $+ 2r$

$= 6\pi + 9$

Keywords

Congruent: The same

Area: Space inside a 2D object

Perimeter: Length around the outside of a 2D object

Pi (π): The ratio of a circle's circumference to its diameter.

Perpendicular: At an angle of 90° to a given surface

Formula: A mathematical relationship/ rule given in symbols. E.g. b x h = area of rectangle/ square

Infinity (∞): A number without a given ending (too great to count to the end of the number) – never ends

Sector: A part of the circle enclosed by two radii and an arc.