Properties of triangles: a review

⭐ By the end of the lesson I would hope that you have an understanding (and be able to apply to questions) the following concepts:
- What interior angles are
- What exterior angles are
- What an equilateral triangle is
- What a bisector is
- What an isosceles triangle is
- What a right angled triangle is

RECAP:

In the last video we took some time to review the rules for parallel lines. This was work which we have met in earlier years. This video is another recap of work which has been completed in previous year levels. We are going to recap the work on Triangles but take it that little bit deeper!
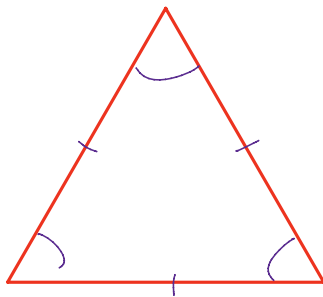
Interior and Exterior Angles

Interior = inside
Exterior = outside

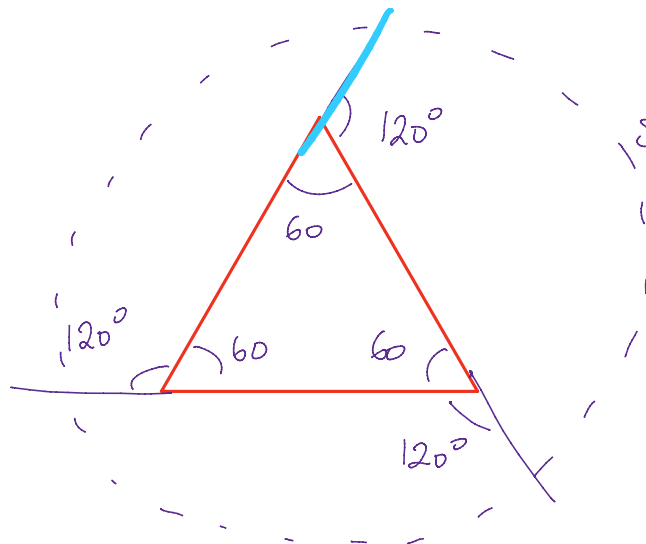It is important to know the sum of **interior** and **exterior** angles.

Interior angles:

$$Int = 180°$$

Exterior angles:

$$Sum\ Ext = 120 + 120 + 120$$
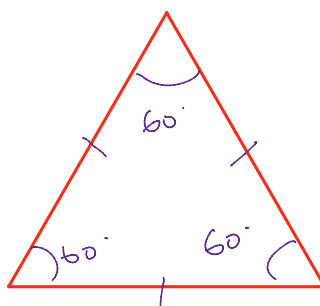$$= 360°$$

120° 60
120° 60 60
120°

Types of Triangles

There are four main types of triangles which we need to know about:
- Equilateral
- Isosceles
- Scalene
- Right Angled

Equilateral Triangles

These triangles have three sides which are the same length and three angles which are the same size.
Angles in an equilateral triangles are all 60°
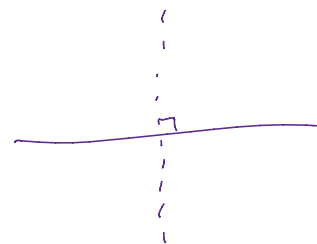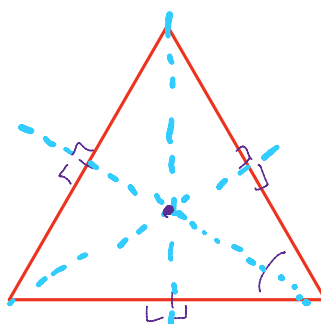
Bisectors of angles Equilateral Triangles

When we bisect a line we cut it in two.
This is the same when we bisect an angle.
The bisector of each of the angles of an equilateral triangle meets the opposite side at right angles and passes through the midpoint of that side.

Isosceles Triangles

These triangles have two sides which are the same length and two angles which are the same size.
The marks we place on the side of the triangle point to the corners which have the same size!
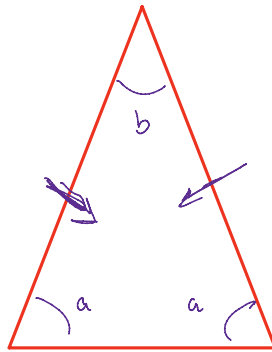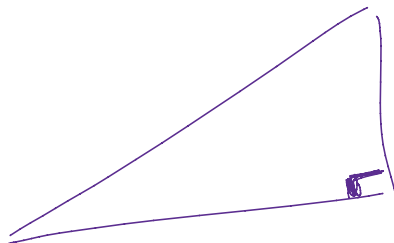
$$b = 180° - a - a$$
$$= 180° - 2a$$

Right Angled Triangles

As the name suggests, these are the triangles which have a right angle as one of their interior angles.
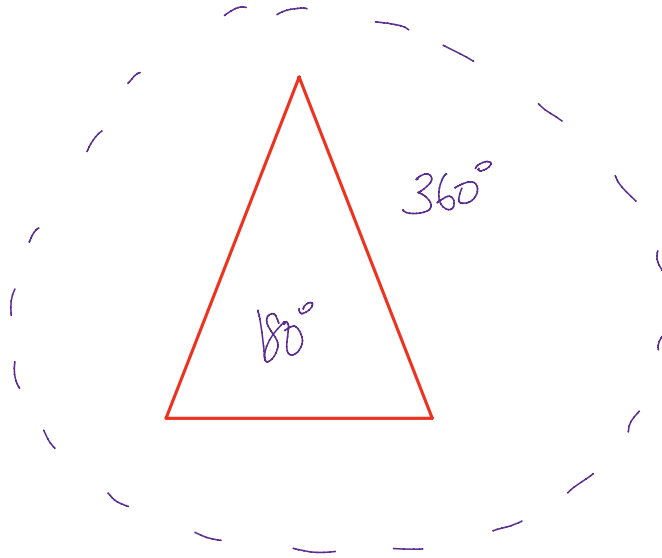A right angle is 90° in size.

Sums of interior and exterior angles

The sum of the interior angles for any triangle is 180°
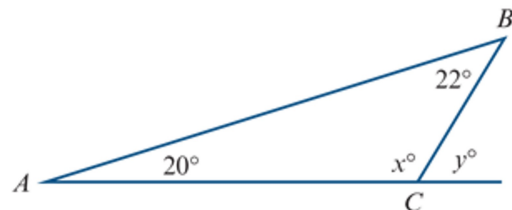The sum of the exterior angles for any triangle is 360°

$360°$

$180°$

Examples

The following examples are used, with permission, from the Cambridge Further Mathematics Units 3 and 4 textbook.

Example 1
Find the values of the pronumerals

$20 + 22 + x = 180°$

$42 + x = 180°$

$x + y = 180°$

$138 + y = 180$

$$42 + x = 180°$$
$$x = 180° - 42°$$
$$x = 138°$$

$$138 + y = 180$$
$$y = 180 - 138$$
$$y = 42°$$

Example 2
Find the values of the pronumerals
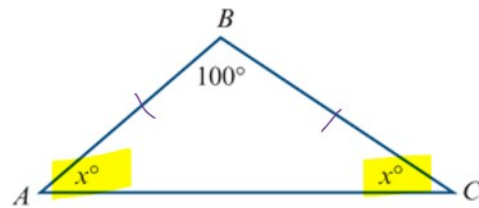
$$180° = 100° + x + x$$

-100 $$180 = 100 + 2x \quad -100$$

$$80 = 2x$$

$$x = 40°$$