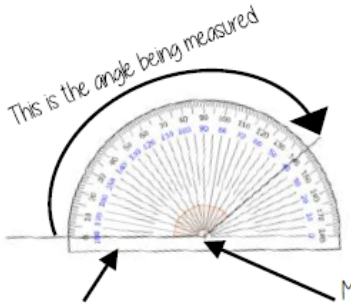
Knowledge Organiser: Year 8 Maths; Angles

Measure angles to 180°

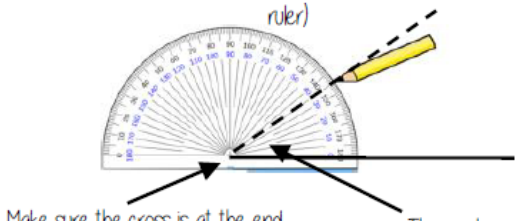


Read from 0° on the base line.
Remember to use estimation.
This is an obtuse angle so between 90 ° and 180 °

Draw angles up to 180°

Draw a 35° angle

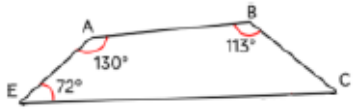
Make a mark at 35° with a pencil
And join to the angle point (use a ruler)



Angle notation

R

The letter in the middle is the angle
The arc represents the part of the angle



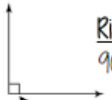
Angle Notation: three letters $A\hat{B}C$ This is the angle at B = 113 °

$\angle ABC$ is also used to represent the angle at B.

Basic angle rules and notation

R

Acute Angles
0°< angle <90°



Right Angles
90°

Right angle notation

Obtuse
90°< angle <180°

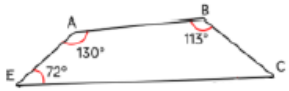
Reflex
180°< angle <360°

Straight Line
180°

Vertically opposite angles
Equal

Angles around a point
360 °

The letter in the middle is the angle
The arc represents the part of the angle



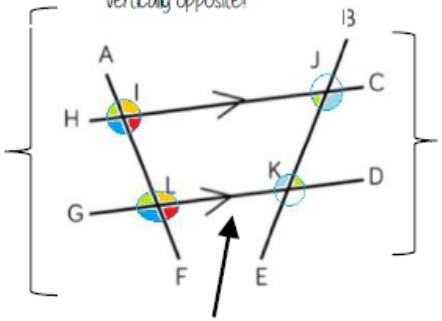
Angle Notation: three letters ABC
This is the angle at B = 113 °
Line Notation: two letters EC
The line that joins E to C.

Parallel lines

Still remember to look for angles on straight lines, around a point and vertically opposite!

Lines QF and BE are **transversals** (lines that bisect the parallel lines)

Corresponding angles often identified by their "F shape" in position



Alternate angles often identified by their "Z shape" in position

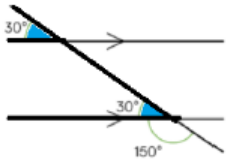
This notation identifies parallel lines

Keywords

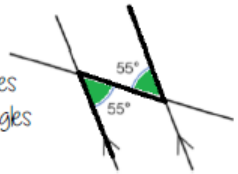
Parallel: Straight lines that never meet
Angle: The figure formed by two straight lines meeting (measured in degrees)
Transversal: A line that cuts across two or more other (normally parallel) lines
Protractor: mathematical equipment used to measure angles
Angle: the amount of turn between two lines around their common point

Adjacent: lying next to each other
Sum: addition
Quadrilateral: a four-sided polygon
Polygon: an enclosed 2D shape made up of straight lines
Scalene triangle: a triangle with all different sides and different angles
Regular Polygon: a polygon with equal angles and all sides the same size

Alternate/ Corresponding angles

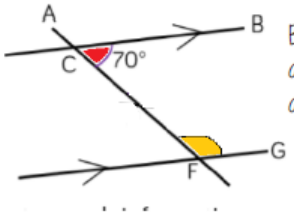


Because alternate angles are equal the highlighted angles are the same size



Because corresponding angles are equal the highlighted angles are the same size

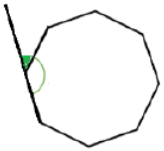
Co-interior angles



Because co-interior angles have a sum of 180° the highlighted angle is 110°

As angles on a line add up to 180° co-interior angles can also be calculated from applying alternate/ corresponding rules first

Missing angles in regular polygons



Exterior angle = 360 ÷ 8 = 45°

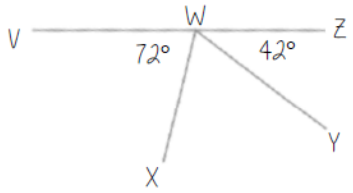
Interior angle = $\frac{(8-2) \times 180}{8}$ = $\frac{6 \times 180}{8}$ = 135°

Exterior angles in regular polygons = 360° ÷ number of sides

Interior angles in regular polygons = $\frac{(\text{number of sides} - 2) \times 180}{\text{number of sides}}$

Sum of angles on a straight line

Adjacent angles that share a common point on a line add up to 180°



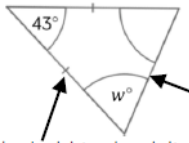
Find angle XWY

72° + 42° = 114°

180° - 114° = 66°

Sum of angles in triangles

Sum of interior angles in a triangle = 180°



The two base angles will be the same size

Look at triangle notation
This indicates an isosceles triangle

∴ 180 - 43 = 137

137 ÷ 2 = 68.5°

A triangle can only have ONE right angle

Have a go!
Tearing the corners from triangles forms a straight line which is therefore 180°

Triangles & Quadrilaterals

Link to steps

Side, Angle, Angle

Side, Angle, Side

Side, Side, Side

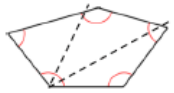
Sum of interior angles

(number of sides – 2) x 180

Interior Angles
The angles enclosed by the polygon

This is an irregular polygon – the sides and angles are different sizes

Sum of the interior angles = (5 – 2) x 180



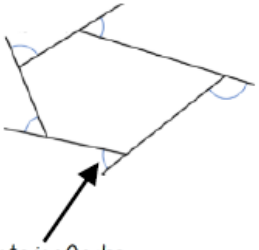
This shape can be made from three triangles
Each triangle has 180°

Sum of the interior angles = 3 x 180
= 540°

Remember this is all of the interior angles added together

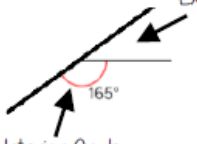
Sum of exterior angles

Exterior angles all add up to 360°



Exterior Angles
Are the angle formed from the straight-line extension at the side of the shape

Using exterior angles



Interior angle + Exterior angle = straight line = 180°
Exterior angle = 180 – 165 = 15°

Number of sides = 360° ÷ exterior angle
Number of sides = 360 ÷ 15 = 24 sides

How do we use Knowledge Organisers in Mathematics?

How can you use knowledge organisers at home to help us?

- **Retrieval Practice**: Read over a section of the knowledge organiser, cover it up and then write down everything you can remember. Repeat until you remember everything.
- **Flash Cards**: Using the Knowledge Organisers to help on one side of a piece of paper write a question, on the other side write an answer. Ask someone to test you by asking a question and seeing if you know the answer.
- **Mind Maps**: Turn the information from the knowledge organiser into a mind map. Then reread the mind map and on a piece of paper half the size try and recreate the key phrases of the mind map from memory.
- **Sketch it**: Draw an image to represent each fact; this can be done in isolation or as part of the mind map/flash card.
- **Teach it**: Teach someone the information on your knowledge organiser, let them ask you questions and see if you know the answers.

How will we use knowledge organisers in Mathematics?

Knowledge organisers will be used before I complete a Learning Check or Common Assessment. I will spend part of the lesson looking over each of the key topics of the half term before completing the Learning Check or Common Assessment.

I will also use these at home to complete my own independent learning and revision of these key topics.