Key words

**Angle**: the figure formed by two straight lines meeting (measured in degrees)
Vertically opposite: Angles formed when two or more straight lines cross at a point
Interior angles: Angles in side a shape
Sum: Addition, when talking about angles it usually means all of the interior angles added together
Polygon: A 2D shape made with straight lines
Regular Polygon: All sides are equal size and all angles are equal size.
Scalene triangle: A triangle with all different size sides and angles
Isosceles triangle: A triangle with two sides the same size and two angles the same size
Right-angled triangle: a triangle with a right angle in

Parallel lines

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

Lines AF and BE are **transversals** (lines that bisect the parallel lines)
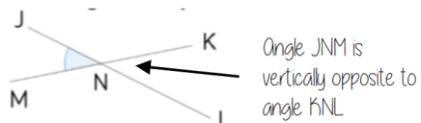
Corresponding angles often identified by their "F shape" in position.
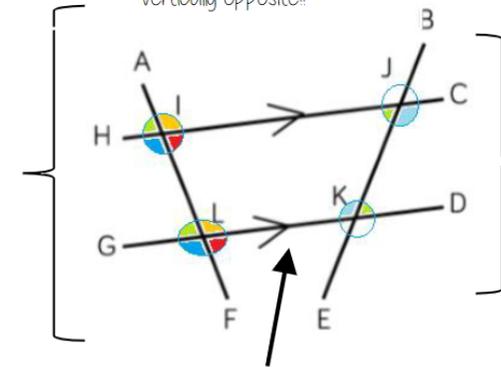
Alternate angles often identified by their "Z shape" in position

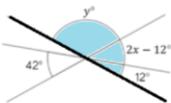This notation identifies parallel lines

Vertically opposite angles

Angle JNM is vertically opposite to angle KNL

JNM = KNL
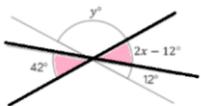
Vertically opposite angles are the same

Other angle rules still apply
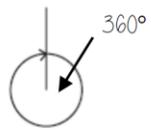Look for straight line sums and angles around a point.

Form equations with information from diagrams:
$2x - 12 = 42$
$2x = 54$
$x = 27°$

Sum of angles at a point

The sum of angles around a point is 360°

360°

Find angle BOE
$90° + 33° + 92° = 205°$
$360° - 205°$
BOE = 155°

Angle notation – 90°
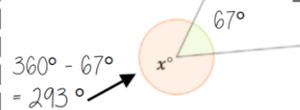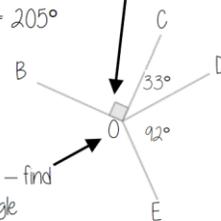
Angle notation – find this missing angle

$360° - 67°$
$= 293°$

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°
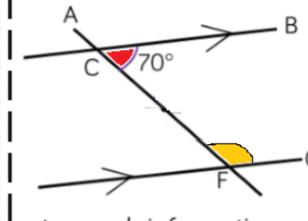
Alternate/ Corresponding angles
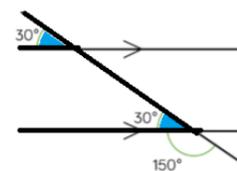
Because alternate angles are equal the highlighted angles are the same size

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

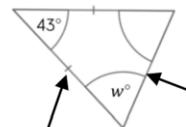30°
30°
150°
55°
55°
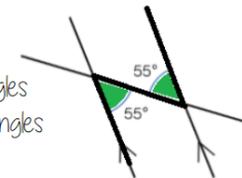
Co-interior angles

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

70°

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

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Angle Problems

Split up the problem into chunks and explain your reasoning at each point using angle notation

Keep working out clear and notes together

$EDF = \_\_\_°$
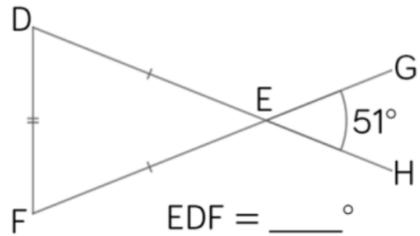
1. Angle DEF = 51° because it is a vertically opposite angle DEF = GEH

2. Triangle DEF is isosceles (triangle notation) $\therefore$ EDF = EFD and the sum of interior angles is 180°

   $180° - 51° = 129°$ $129° \div 2 = 64.5°$
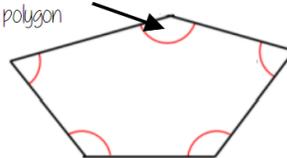
3. Angle EDF = 64.5°

Missing angles in regular polygons
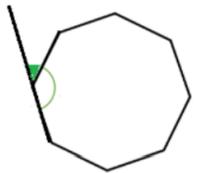
Exterior angle = 360 ÷ 8 = 45°

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 = $\frac{(number\ of\ sides - 2) \times 180}{number\ of\ sides}$
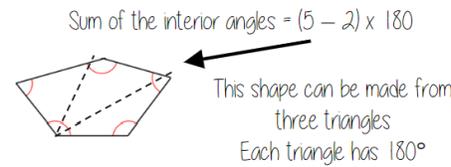
Sum of interior angles

$(number\ of\ sides - 2) \times 180$

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 = $(5 - 2) \times 180$
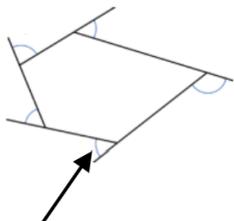
This shape can be made from three triangles
Each triangle has 180°

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

Remember this is **all** of the interior angles added together

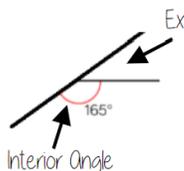## Sum of exterior angles

Exterior angles all add up to 360°

Using exterior angles

Exterior Angle

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

165°

Interior Angle

Exterior Angles

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