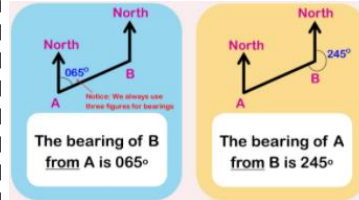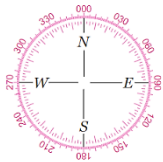# Year 8 Knowledge Organiser –
Angles and Construction

Objectives

Measure line segments and angles in geometric figures, including interpreting maps and scale drawings and use of bearings

Deduce angle sums in polygons and describe their properties

Understand and use alternate and corresponding angles on parallel lines

Construct perpendicular line bisectors and angle bisectors

Solve loci problems

Key Vocabulary

Bearing - a bearing is the angle in degrees measured clockwise from north

Arc – a curved locus, drawn using a compass

Bisector – a line which divides something into two equal parts

Perpendicular – two lines which intersect at right angles

Locus (loci) – a set of points that share a property (e.g. the same distance away from a centre object)

Parallel – two lines which are equidistant (never meet)

Polygon – a 2D shape with straight edges

North

The bearing of B from A is 065°

The bearing of A from B is 245°

Draw and measure line segments

Conversions 1cm = 10mm, 1m = 100cm

A   B

The line segment is 3.9cm
Which is 39mm

AB is a line segment (part of the line)
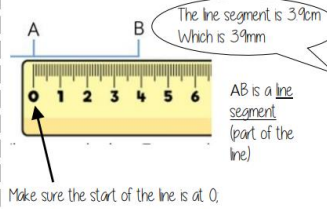
Make sure the start of the line is at 0.

Bearings

A bearing is the angle in degrees measured clockwise from north. Bearings are usually given as a three-figure bearing. For example, 30° clockwise from north is usually written as 030°.
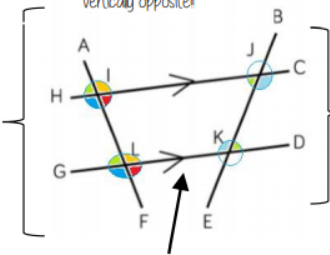
Remember that the sum of angles in a triangle is always 180°. You can use this fact to work out angle sums in polygons. See how many triangles you can fit into your polygon!

(i)

(ii)

Parallel lines

Still remember to look for angles on straight lines, around a point and vertically opposite!
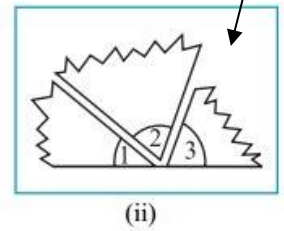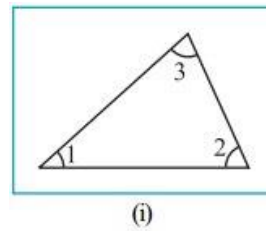
Lines OF and BE are transversals (lines that bisect the parallel lines)

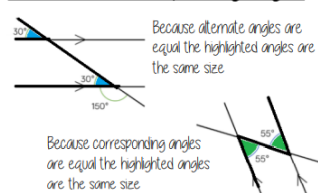Corresponding angles often identified by their "F shape" in position

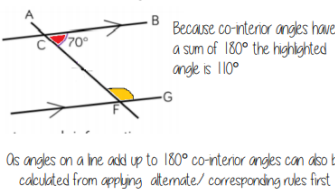Alternate angles often identified by their "Z shape" in position

This notation identifies parallel lines
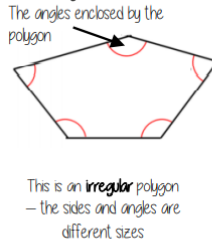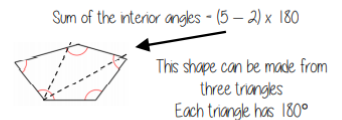
Alternate/ Corresponding angles

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

Sum of interior angles

Interior Angles
The angles enclosed by the polygon

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

(number of sides – 2) x 180

Sum of the interior angles = (5 – 2) x 180
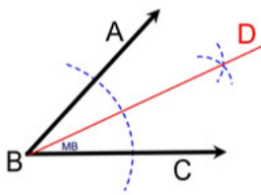
This shape can be made from three triangles
Each triangle has 180°

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

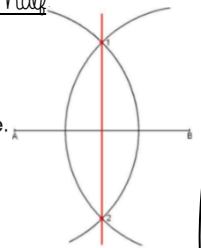Remember this is **all** of the interior angles added together

Angle bisector (cuts an angle in half)

1. Place the sharp end of a pair of compasses on the vertex.
2. Draw an arc, marking a point on each line.
3. Without changing the compass put the compass on each point and mark a centre point where two arcs cross over.
4. Use a ruler to draw a line through the vertex and centre point.

Perpendicular bisector (cuts an line in half at right angles)

1. Put the sharp point of a pair of compasses on A.
2. Open the compass over half way on the line.
3. Draw an arc above and below the line.
4. Without changing the compass, repeat from point B.
5. Draw a straight line through the two intersecting arcs.

Loci	A point, line, or curve moving according to mathematically defined conditions.	The red line is the loci of all the points equidistant from the black line.