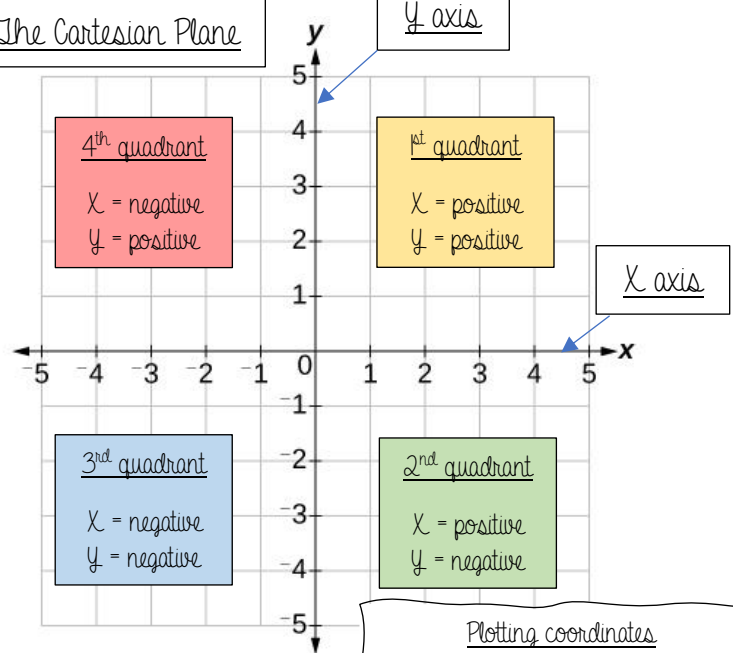# Year 7 Knowledge Organiser –

Angles and Construction

Objectives

Use standard convention to refer to angles and sides

Draw diagrams from written descriptions

Identify, describe and construct congruent shapes, including on coordinate axes, by considering rotation, reflection and translation

Describe the properties and definitions of quadrilaterals and triangles

Apply the properties of angles at a point, angles at a point on a straight line and vertically opposite angles

Key Vocabulary

Coordinate – Describes location of a point on the x and y axes

Quadrant – Four quadrants (quarters) of a coordinate grid

Angle – The distance, measured in degrees, between two arms

Congruent – Two objects are congruent if they are the same shape and size (or mirror images of each other)

Quadrilateral – A four sided 2D shape

Vertically opposite – Angles directly opposite each other around a point

Polygon – A 2D shape with straight edges

Parallel – Two lines which are equidistant (never meet)

Perpendicular – Two lines which intersect at right angles

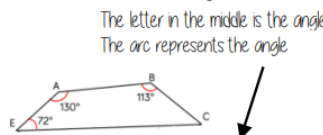## The Cartesian Plane

Y axis

X axis

4th quadrant
X = negative
Y = positive

1st quadrant
X = positive
Y = positive

3rd quadrant
X = negative
Y = negative

2nd quadrant
X = positive
Y = negative

Plotting coordinates

(x, y)
Start at (0,0) which is called the origin. Move left/right first for your x coordinate, then up/down for your y coordinate.
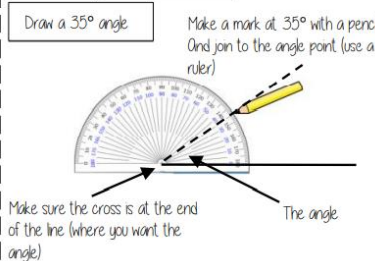
Letter and labelling convention

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

A   B
130°   113°
E   72°   C

Angle Notation: three letters ABC
This is the angle at B = 113 °

Line Notation: two letters EC
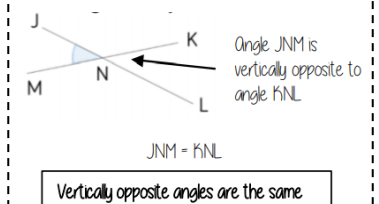The line that joins E to C.

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)

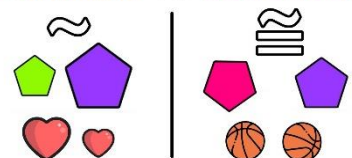Make sure the cross is at the end of the line (where you want the angle)

The angle

Angles

Around a point – sum to 360°

On a straight-line sum to 180°

Vertically opposite angles are equal
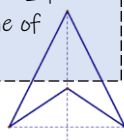
In a quadrilateral sum to 360°

In a triangle sum to 180°

Properties of Quadrilaterals

Square
All sides equal size
All angles 90°
Opposite sides are parallel

Rectangle
All angles 90°
Opposite sides are parallel

Rhombus
All sides equal size
Opposite angles are equal

Parallelogram
Opposite sides are parallel
Opposite angles are equal
Co-interior angles

Trapezium
One pair of parallel lines

Kite
No parallel lines
Equal lengths on top sides
Equal lengths on bottom sides
One pair of equal angles

Vertically opposite angles

J   K
M   N   L

Angle JNM is vertically opposite to angle KNL

JNM = KNL

Vertically opposite angles are the same

Don't forget the **arrowhead** (or **delta**) which is a very special quadrilateral! It is the only quadrilateral which has an internal reflex angle. It also has 2 pairs of equal adjacent sides and 1 line of symmetry...

Types of Triangles

Equilateral triangle
All sides the same length
All internal angles the same

Isosceles triangle
2 sides the same length
2 internal angles the same

Right-Angled triangle
1 internal angles that is 90°
Can be either scalene or isosceles as well

Scalene triangle
All the different length
All internal angles different

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SIMILAR VS CONGRUENT