# YEAR 7 — LINES AND ANGLES
## Constructing, measuring and using geometric notation

@whisto_maths

## What do I need to be able to do?

By the end of this unit you should be able to:
- Use letter and labelling conventions
- Draw and measure line segments and angles
- Identify parallel and perpendicular lines
- Recognise types of triangle
- Recognise types of quadrilateral
- Identify polygons
- Construct triangles (SAS, SSS, ASA)
- Draw Pie charts

## Keywords

**Polygon** – A 2D shape made with straight lines
**Scalene triangle** – a triangle with all different sides and angles
**Isosceles triangle** – a triangle with two angles the same size and two angles the same size
**Right-angled triangle** – a triangle with a right angle
**Frequency** – the number of times a data value occurs
**Sector** – part of a circle made by two radii touching the centre
**Rotation** – turn in a given direction
**Protractor** – equipment used to measure angles
**Compass** – equipment used to draw arcs and circles.

## Letter and labelling convention

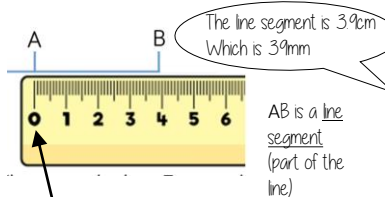The letter in the middle is the angle
The arc represents the angle
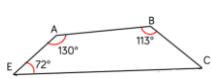
**Angle Notation:** three letters ABC
This is the angle at B = 113 °

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

## Draw and measure line segments

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

The line segment is 3.9cm
Which is 39mm

AB is a line segment (part of the line)

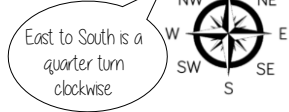Make sure the start of the line is at 0,

## Angles as measures of turn

Clockwise    Anti-Clockwise

East to South is a quarter turn clockwise
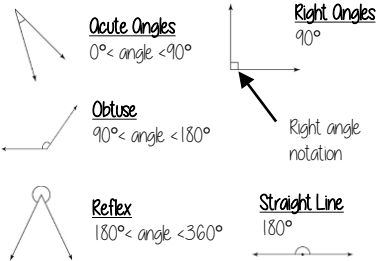
**Quarter Turn** 90° Clockwise
**Half Turn** 180°
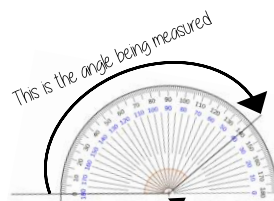**Three-quarter Turn** 270° Anti-Clockwise
**Full Turn** 360°

## Classify angles

**Acute Angles** 0°< angle <90°

**Right Angles** 90°

**Obtuse** 90°< angle <180°

Right angle notation

**Reflex** 180°< angle <360°

**Straight Line** 180°

## Measure angles to 180°

This is the angle being measured

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

The base line follows the line segment

Make sure the cross is at the point the two lines meet

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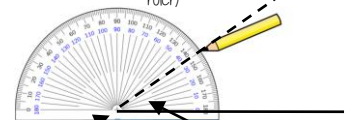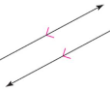
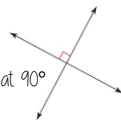Make sure the cross is at the end of the line (where you want the angle)

The angle

## Parallel and Perpendicular lines

**Parallel lines**
Straight lines that never meet
(Have the same gradient)

**Perpendicular lines**
Straight lines that meet at 90°

## Angles over 180°

360 ° - smaller angle = reflex angle

Use your knowledge of straight lines 180 ° and angles around a point 360 °

Measure the smaller angle first (less than 180 °

## Properties of Quadrilaterals

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

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

**Rectangle**
All angles 90°
Opposite sides are parallel

**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

**Rhombus**
All sides equal size
Opposite angles are equal

## Draw Pie Charts

| Type of pet | Dog | Cat | Hamster |
|---|---|---|---|
| Frequency | 32 | 25 | 3 |

$\frac{32}{60}$ "32 out of 60 people had a dog"

This fraction of the 360 degrees represents dogs

$\frac{32}{60}$ X 360 = 192°

Use a protractor to draw
This is 192°

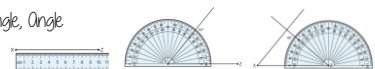## SAS, SSS, ASA constructions
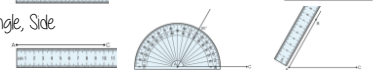
Side, Angle, Angle

Side, Angle, Side

Side, Side, Side

## Polygons

| | | |
|---|---|---|
| 3 – Triangle | 5 – Pentagon | 8 – Octagon |
| 4 – Quadrilateral | 6 – Hexagon | 9 – Nonagon |
| | 7 – Heptagon | 10 – Decagon |
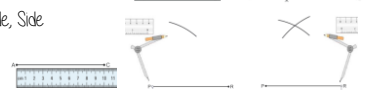
If all the sides and angles are the same, it is a **regular** polygon