

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:

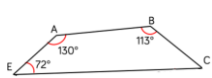
- Use letter and labelling conventions
- Draw and measure line segments and angles
- Identify parallel and perpendicular lines
- Recognise types of triangle
- Recognise types of quadrilateral
- Identify polygons
- Construct triangles (SAS, SSS, ASA)
- Draw Pie charts

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 sides 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

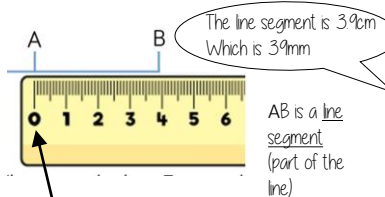


Angle Notation: three letters ABC
This is the angle at B = 113°

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

Draw and measure line segments

Conversions $1\text{cm} = 10\text{mm}$, $1\text{m} = 100\text{cm}$



Make sure the start of the line is at 0.

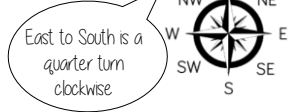
Angles as measures of turn



Clockwise



Anti-Clockwise



East to South is a quarter turn clockwise



Quarter Turn
 90°
Clockwise



Half Turn
 180°

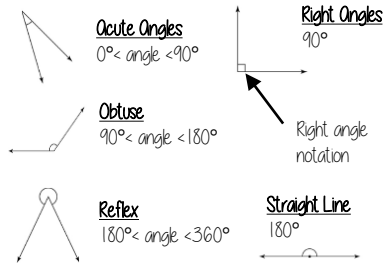


Three-quarter Turn
 270°
Anti-Clockwise

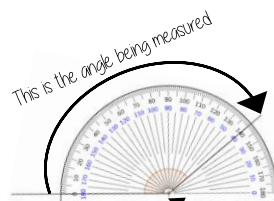


Full Turn
 360°

Classify angles



Measure angles to 180°



The base line follows the line segment
Make sure the cross is at the point the two lines meet

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

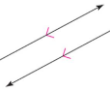
Make a mark at 35° with a pencil
And join to the angle point (use a ruler)



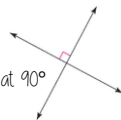
Make sure the cross is at the end of the line (where you want the angle)

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°

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

360° - smaller angle = reflex angle



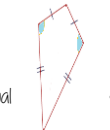
Measure the smaller angle first (less than 180°)

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

Draw Pie Charts

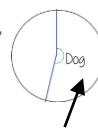
Type of pet	Dog	Cat	Hamster
Frequency	32	25	3

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

This fraction of the 360 degrees represents dogs

$\frac{32}{60} \times 360 = 192^\circ$

Use a protractor to draw
This is 192°



Polygons

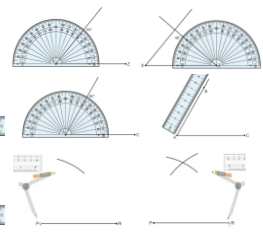
3	- Triangle	5	- Pentagon	8	- Octagon
4	- Quadrilateral	6	- Hexagon	9	- Nonagon
		7	- Heptagon	10	- Decagon

SAS, SSS, ASA constructions

Side, Angle, Angle

Side, Angle, Side

Side, Side, Side



If all the sides and angles are the same, it is a **regular** polygon