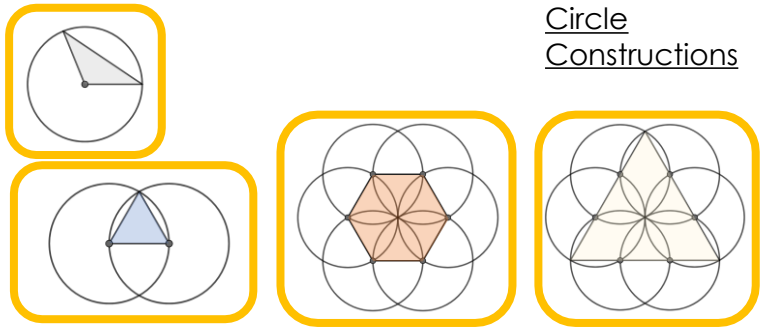
Y7 Mastery: Unit 9 – Constructing triangles and quadrilaterals

Circle Constructions

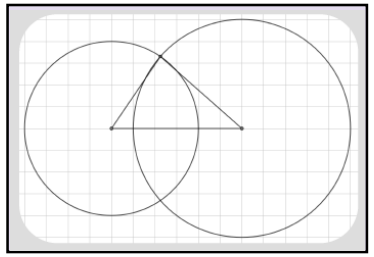


By drawing circles, you can **construct** various **polygons**.

Constructing Triangles – given 3 side lengths

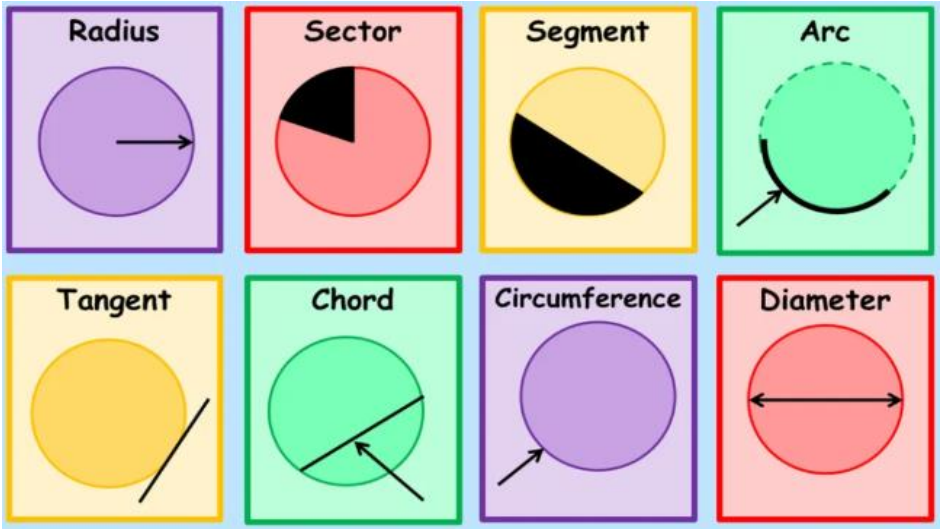
Using **ruler** and **compasses**, you can **construct** any triangle, given its three side lengths.

This triangle has side lengths 6cm, 5cm and 4 cm.
The 6cm line was drawn with a ruler. Then circles with radii 5cm and 4cm were constructed at either end of the 6cm line.
The intersection points show where the other vertex should be.



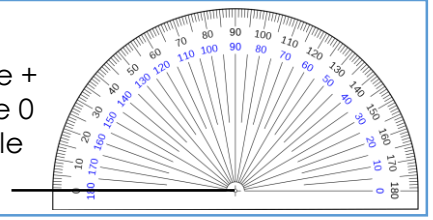
Circle Properties

You need to know these parts of a circle:



Using a protractor

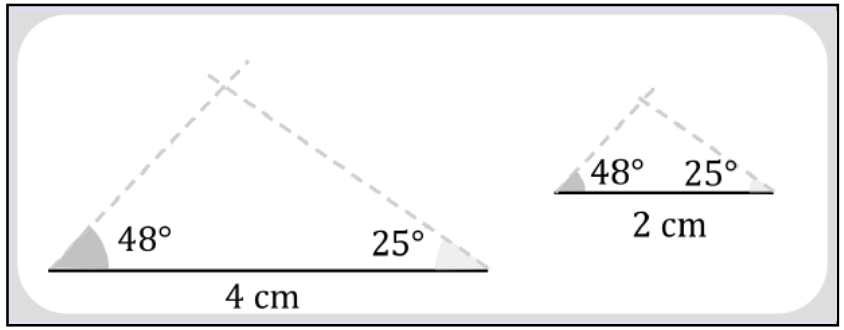
Always position your protractor with the + over the end of the line and line up the 0 on the scale. Count from 0 on the scale when measuring an angle.



Constructing Triangles – given 2 angles

Using **ruler** and **protractor**, you can **construct** any triangle, given two of its angles.

These triangles both have interior angles of 48° and 25° but the side lengths are different.
Draw the side in between the two angles first; sometimes this is given to you in the question. Then measure the angles from each end of the line – make sure the protractor is lined up correctly!
Extend your construction lines until they intersect (but don't rub them out – the examiner will want to see them).
The intersection points show where the other vertex should be.



Other Topics/Units this could appear in:

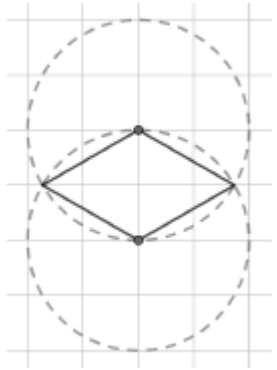
Year 9/10:
- Unit 8 – Mensuration
- Unit 43 – Constructions
- Unit 35 – Bearings
- Unit 37 – Interior and exterior angles

Keyword/Skill	**Definition/Tips**
Polygon	2-D shape with straight sides and no curved sides.
Regular polygon	All the sides are exactly the same length, all the interior angles are exactly the same size.
Construct	Use ruler, pencil, protractor and compasses to accurately draw a given shape.
Similar	Shapes that are have the same angles, but the side lengths on one have been enlarged by a scale factor.
Congruent	Shapes that are exactly the same, but may be rotated (turned around) or reflected (flipped over).
Adjacent	Next to one another.
Intersect (intersection)	Where two line segments cross or meet at a point.
Symmetry	Line symmetry is where something can be folded in half and both halves are congruent. Rotational symmetry is where something can be rotated around its centre and still look the same.

Y7 Mastery: Unit 9 – Constructing triangles and quadrilaterals

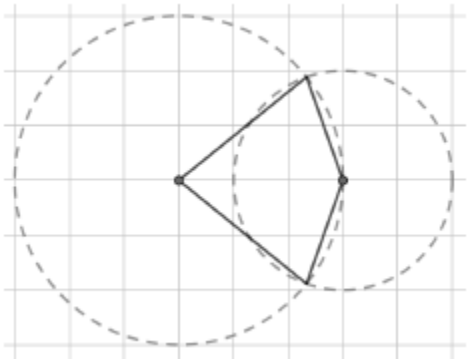
Constructing Quadrilaterals

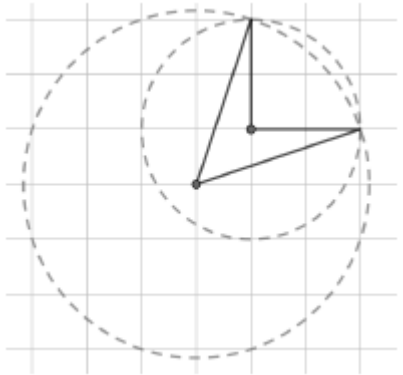
Using **ruler**, **compasses** and **protractor**, you can **construct** any quadrilateral, using the skills you learnt when constructing triangles.



Two intersecting circles with the same radius will form a **rhombus** when you join the radii to the intersection points on the circumferences.

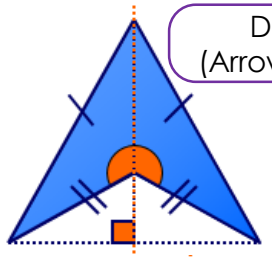
Two intersecting circles with different radii will form a **kite** when you join the radii to the intersection points on the circumferences.



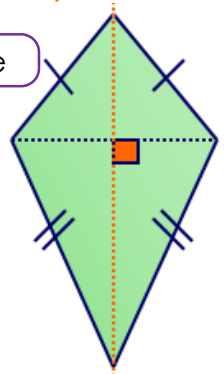


Two overlapping circles with different radii will form a **delta** when you join the radii to the intersection points on the circumferences.

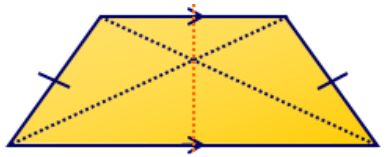
Quadrilaterals – Names and Properties



Delta (Arrowhead)

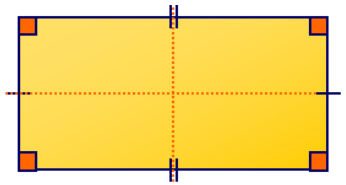


Kite



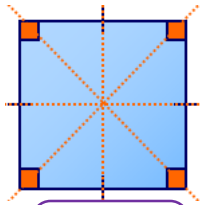
Isosceles Trapezium

Trapezium

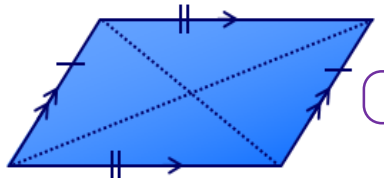


Rectangle

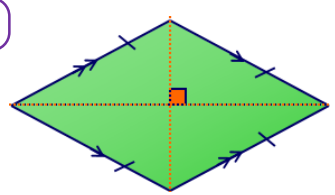
You need to recognise these **quadrilaterals**, and know their **properties**.



Square



Parallelogram



Rhombus

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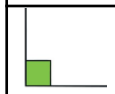
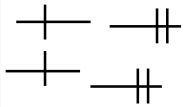
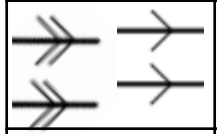
Keyword/Skill	**Definition/Tips**
	Squares show right-angles, which are always 90°.
	Short lines crossing sides show pairs or groups of sides that are the same length.
	Arrows are used to show pairs of parallel sides on a shape.
	Orange dotted lines show lines of symmetry. Blue dotted lines show diagonals (joining opposite corners).
Trapezoid	This is the American word for trapezium. You may see it in online resources.