

# Year 9 Spring 1

## KEYWORDS:

**Vertically Opposite Angles** Angles that are opposite each other when two lines intersect each other.

**Alternate Angles** Alternate angles form a 'Z' shape, when the lines are parallel.

**Parallel Lines** Two lines that are always the same distance apart and never meet.

**Perpendicular Bisector** A line which cuts a line segment into two equal parts at 90°.

**Corresponding Angles** The angles which occupy the same relative position at each intersection where a straight line crosses two others.

**Interior Angles** An angle formed inside a polygon by two adjacent sides.

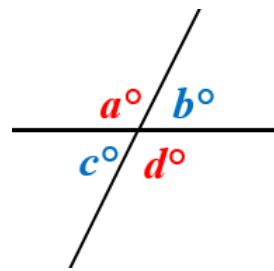
**Exterior Angles** The angle between any side of a shape, and a line extended from the next side.

**Tessellations** An arrangement of shapes closely fitted together in a repeated pattern without gaps or overlapping.

## Vertically Opposite Angles

Angles  $a$  and  $d$  are equal. They are vertically opposite.

Angles  $b$  and  $c$  are equal. They are vertically opposite.



Video 480

## Interior and Exterior Angles

The sum of the interior angles in an  $n$ -sided polygon is  $(n - 2) \times 180^\circ$ .

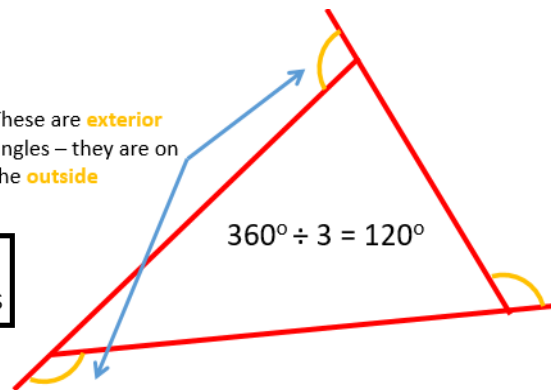
These are interior angles – they are on the inside

$$(n - 2) \times 180^\circ$$

$$(3 - 2) \times 180^\circ$$

$$= 180^\circ$$

Adding the exterior and interior angles together always gives a total of  $180^\circ$



These are exterior angles – they are on the outside

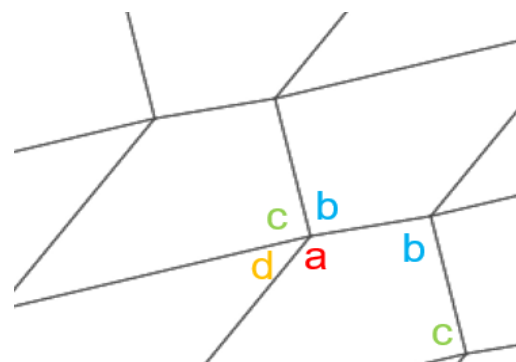
$$360^\circ \div 3 = 120^\circ$$

The sum of Exterior angles in any polygon =  $360^\circ$

Exterior angle =  $360^\circ \div \text{number of angles}$

Videos 560-565

## Tessellations

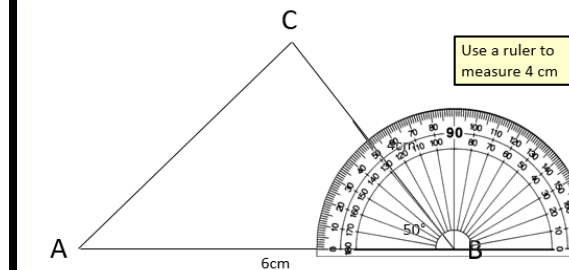


We know that  $a + b + c + d = 360^\circ$

Which means that quadrilaterals will always tessellate.

## Constructing Triangles

Using a ruler and protractor, construct a triangle  $ABC$  where  $AB = 6\text{cm}$ ,  $BC = 4\text{cm}$  and  $\angle ABC = 50^\circ$ .



Use a ruler to measure 4 cm

Use a ruler to measure 6cm

Use a protractor to measure  $50^\circ$

Use a ruler to measure 4cm

Construct a triangle of side lengths 8 cm, 7 cm and 6 cm



Use a ruler to measure 8cm

Set compass to 7cm. Place on left point and draw arc

Set compass to 6cm. Place on right point and draw arc

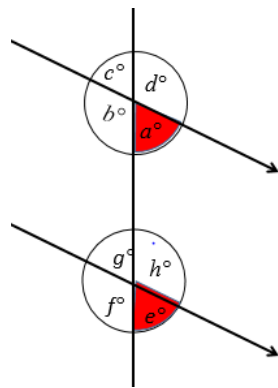
Videos 664-667

## Angles in Parallel Lines

Angles  $a$  and  $e$  are equal.

Angles  $b$  and  $f$  are equal.

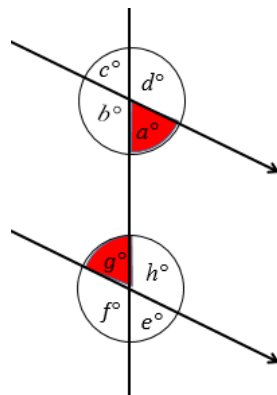
They are corresponding angles.



Angles  $a$  and  $g$  are equal.

Angles  $b$  and  $h$  are equal.

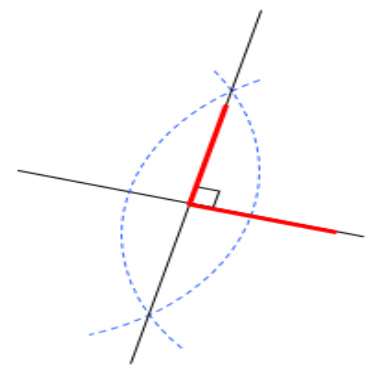
They are alternate angles.



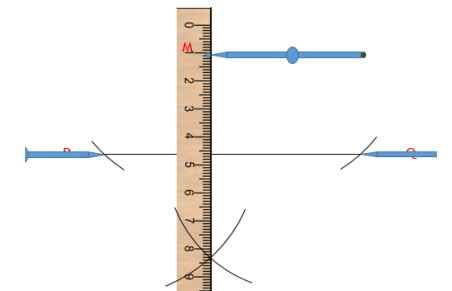
Videos 481-483

## Construction

Using a compass and ruler only can you construct a 90 degree angle with a perpendicular bisector



When constructing a perpendicular from a point the new path is the shortest possible distance to the line



Videos 660-663