

# Y8 Angles in parallel lines and polygons



# What do I need to be able to do?

### By the end of this unit you should be able to:

- Identify alternate angles
- Identify corresponding angles
- Identify co-interior angles
- Find the sum of interior angles in polygons
- Find the sum of exterior angles in polygons
- Find interior angles in regular polygons

## Keywords

Parallel: Straight lines that never meet

Ongle: The figure formed by two straight lines meeting (measured in degrees)

Transversal: O line that cuts across two or more other (normally parallel) lines

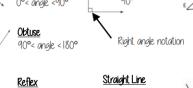
**Isosceles:** Two equal size lines and equal size angles (in a triangle or trapezium)

Polygon: 0 2D shape made with straight lines

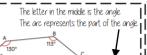
**Sum:** Oddition (total of all the interior angles added together)

Regular polygon: All the sides have equal length; all the interior angles have equal size.

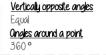
### Basic angle rules and notation 🕡 Right Ongles Ocute Ongles 0°< angle <90° Obtuse







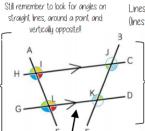
Ongle Notation: three letters ABC This is the angle at B = 113 Line Notation: two letters EC The line that joins E to C.



Co-interior anales

### Parallel lines

Corresponding angles often identified by their "F shape" in position.



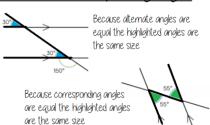
Lines OF and BE are transversals (Ines that bisect the parallel lines)

> Olternate angles often identified by their "Z shape" in position

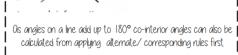
This notation identifies parallel lines

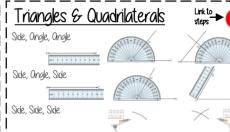
### Olternate/Corresponding angles

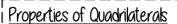
180°< angle <360°





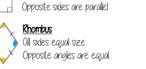












### Parallelogram

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

#### Trapezium

One pair of parallel lines

### Kite

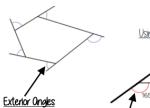
No parallel lines Equal lengths on top sides Equal lengths on bottom sides One pair of equal angles

### Sum of exterior angles

Because co-interior angles have

a sum of 180° the highlighted

angle is 110°



Ore the angle formed from

the straight-line extension

at the side of the shape

Exterior anales all add up to 360°

Using exterior angles Exterior Onale

Interior angle + Exterior angle = straight line = 180° Exterior angle = 180 — 165 = 15°

Number of sides =  $360^{\circ}$  ÷ exterior angle Number of sides =  $360 \div 15 = 24$  sides

# Sum of interio<u>r angles</u>

#### Interior Ongles

The angles enclosed by the polygon

> This is an **irregular** polygon — the sides and angles are different sizes

#### (number of sides -2) x 180

Sum of the interior angles =  $(5 - 2) \times 180$ 



Sum of the interior angles =  $3 \times 180$ = 540°

Remember this is all of the interior angles added together

### Missing angles in regular polygons

Interior angle



Exterior angle =  $360 \div 8 = 45^{\circ}$ Interior angle =  $(8-2) \times 180 = 6 \times 180 = 135^{\circ}$ 

Exterior angles in regular polygons =  $360^{\circ}$  ÷ number of sides

Interior angles in regular polygons =  $(number of sides - 2) \times 180$ number of sides

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