

What do I need to be able to do?

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

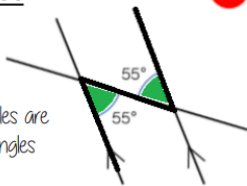
- Identify angles in parallel lines
- Solve angle problems
- Make conjectures with angles
- Make conjectures with shapes

Keywords

- Parallel:** two straight lines that never meet with the same gradient
- Perpendicular:** two straight lines that meet at 90°
- Transversal:** a line that crosses at least two other lines.
- Sum:** the result of adding two or more numbers
- Conjecture:** a statement that might be true but is not proven
- Equation:** a statement that says two things are equal
- Polygon:** a 2D shape made from straight edges
- Counterexample:** an example that disproves a statement

Alternate angles

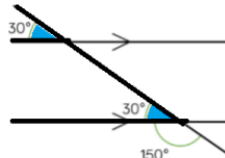
Because alternate angles are equal the highlighted angles are the same size



R

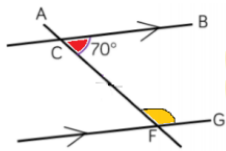
Corresponding angles

Because corresponding angles are equal the highlighted angles are the same size



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Co-interior angles



Because co-interior angles have a sum of 180° the highlighted angle is 110°

As angles on a line add up to 180° co-interior angles can also be calculated from applying alternate/ corresponding rules first

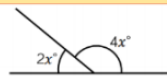
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Solving angle problems

Angles on a straight line



Link angle facts to algebra



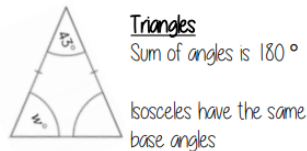
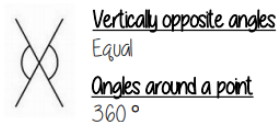
$$2x + 4x = 180^\circ$$

State the reason

The sum of angles on a straight line is 180°

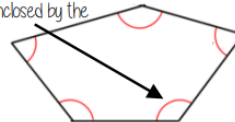
Solve

$$\begin{aligned} 2x + 4x &= 180^\circ \\ 6x &= 180^\circ \\ x &= 30^\circ \end{aligned}$$



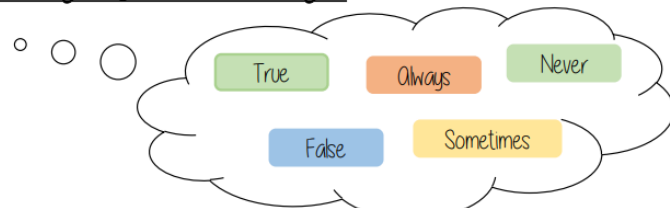
Interior Angles

The angles enclosed by the polygon



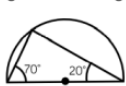
$$(\text{number of sides} - 2) \times 180$$

Making conjectures with angles



Proving a conjecture

A pattern is noticed for many cases

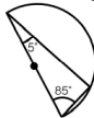


Apply the angle rules

The sum of angles in a triangle is 180°

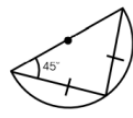
Disproving a conjecture

Only one counterexample is needed to disprove a conjecture



Test the theory

$$\begin{aligned} 180 - 70 - 20 &= 90 \\ 180 - 85 - 5 &= 90 \\ 180 - 45 - 45 &= 90 \end{aligned}$$



Make conjecture

The angle that meets the circumference in a semi circle is 90°

Making conjectures with shapes

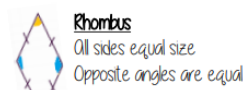
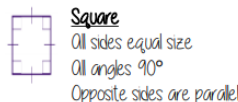
Keywords and facts to recall with shape

Area: the amount of space inside a shape

Perimeter: the length around a shape

Regular Polygons: All sides and angles are equal

Quadrilateral Facts



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



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