

1. The first 12 square numbers

$1^2 = 1$	$7^2 = 49$
$2^2 = 4$	$8^2 = 64$
$3^2 = 9$	$9^2 = 81$
$4^2 = 16$	$10^2 = 100$
$5^2 = 25$	$11^2 = 121$
$6^2 = 36$	$12^2 = 144$

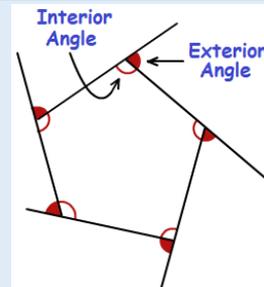
2. Angle facts

Angle - a measure of turn
Acute – Less than 90°
Right angle – Equal to 90°
Obtuse - Greater than 90° , but less than 180°
Reflex - Greater than 180° but less than 360°
 Angles which meet at a **point on a straight line** have a sum of 180°
 All angles **around a point** have a sum of 360° (to make a full turn)
 Angles in a **triangle** have a sum of 180°
 Angles in a **quadrilateral** have a sum of 360°

Parallel lines - the same distance apart
Transversal - A line which intersects two or more other lines
Corresponding angles - On the same side of the transversal and in matching position on each intersection.
Alternate angles are in-between two lines and on opposite sides of the transversal

3. Angles in polygons

Interior angles - The angles inside a polygon at the vertex
 The **sum of interior angles** = $(n - 2) \times 180^\circ$, where n is the number of sides
 To find the size of each interior angle, divide the sum by the number of sides



Exterior angles - The angles between a side of a shape and a line extended from the next side.
 The sum of **exterior angles** in any polygon is 360°
 Each **exterior angle of a regular polygon** = $\frac{360}{n}$
Interior and exterior angles sum to 180°

4. Rotation

Rotation – An object is turned
Rotations are described using a centre of rotation, a direction and angle of turn.
Centre of rotation - The point that a shape is rotated around
Clockwise - The direction the hands of a clock turn
Anti clockwise is the opposite direction of clockwise
 There are 90 degrees in a **quarter** turn
 There are 180 degrees in a **half** turn
 There are 270 degrees in a **three quarter** turn
 There are 360 degrees in a **full** turn
 A rotation 90° **clockwise** is the same as 270° **anti-clockwise**
 A rotation 180° clockwise is the same as 180° anti-clockwise, so the direction does not need to be specified

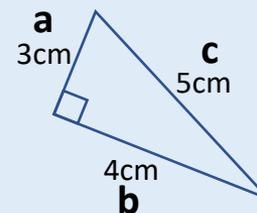
5. Translation

Translate – To move a shape without changing its orientation or size
 A **translated** shape is congruent and has the same orientation as the original shape, but is in a different position
Vectors – are used to describe the movement of a translation
 The top value tells you how far to the left (-) or right (+)
 The bottom value tells you how far up (-) or down (+)

$\begin{pmatrix} 3 \\ -2 \end{pmatrix}$	3 units right 2 units down	$\begin{pmatrix} -1 \\ 4 \end{pmatrix}$	1 unit left 4 units up
$\begin{pmatrix} 0 \\ 4 \end{pmatrix}$	4 units up	$\begin{pmatrix} 3 \\ 0 \end{pmatrix}$	3 units right

6. Pythagoras

Pythagoras' Theorem - $a^2 + b^2 = c^2$
 In any right-angled triangle the square of the long side is equal to the sum of the squares of the other two sides.
Hypotenuse - The longest side in a right-angled triangle, represented by "c"
 The **hypotenuse** is always opposite the right angle



$$a^2 + b^2 = c^2$$

$$3^2 + 4^2 = 5^2$$

$$9 + 16 = 25$$