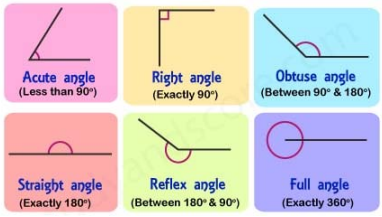
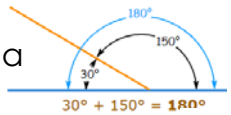
# Maths Knowledge Organiser
## Year 8 Geometry and measures 1

### Types of angles



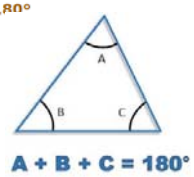

### Angles on a straight line

Angles adjacent to each other on a straight line add up to 180°




### Angles in a triangle

Angles in a triangle add up to 180°

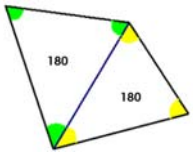



### Angle in parallel lines

Two lines which will never meet are parallel. They are identified by the small arrows.

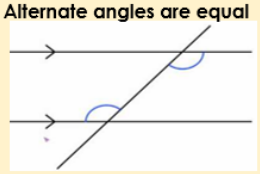
### Angles in a quadrilateral (4 sides)

Angles in a quadrilateral add up to 360°
This is because it is made up of 2 triangles

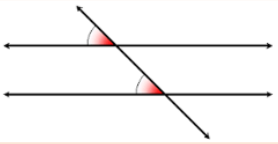



A transversal is a line that crosses parallel lines, and creates special relationships between angles.

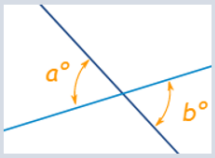
Alternate angles are 2 angles that are either side of the transversal.
**Alternate angles are equal**



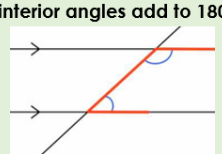
Corresponding angles are 2 angles that are on the same side of the transversal.
**Corresponding angles are equal**



Opposite angles are created by 2 straight lines crossing.
**Opposites angles are equal**

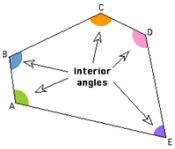



Co-interior angles are made up by 2 angles the same side of the transversal but both inside the parallel lines.
**Co-interior angles add to 180°**



### Interior angles of a polygon

Polygon – A plane shape (two-dimensional) with straight sides.




A regular polygon is a polygon with equal sides and angles

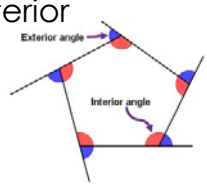
$n$ is the number of sides

To work out the total angles in a regular polygon: $(n-2) \times 180$

To work out the size of one angle in a regular polygon: $total\ angles \div n$

### Exterior angles in a polygon

An exterior angle is 180 – interior angles: $Int + Ext = 180$



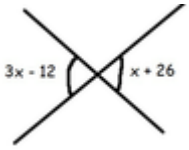

To work out an exterior angle: $\frac{360}{n}$

To work out number of sides: $\frac{360}{exterior\ angle}$

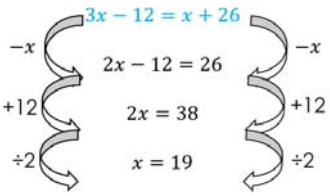
### Angles and algebra

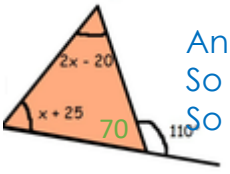
We can apply out angle understanding and algebra understanding.

*Example for angles and algebra*

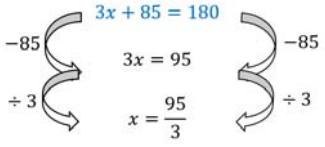



Opposite angles are equal
So $3x - 12 = x + 26$



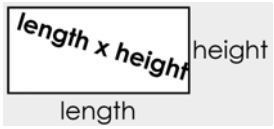

Angles in a triangle add to 180°
So $x + 25 + 2x - 20 + 80 = 180$
So $3x + 85 = 180$

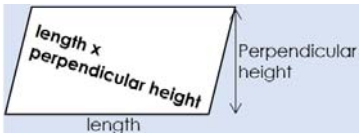


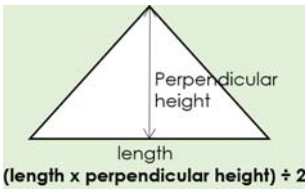
# Maths Knowledge Organiser
## Year 8 Geometry and measures 2

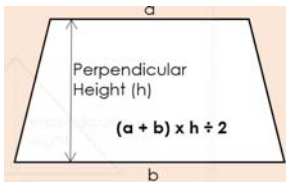
### Area

Area is the space inside a 2D shape



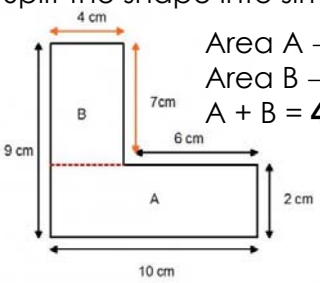



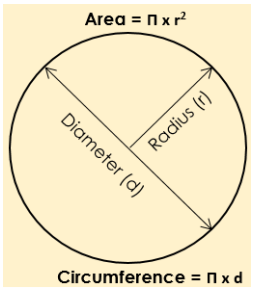




### Compound Area

Split the shape into simpler shapes

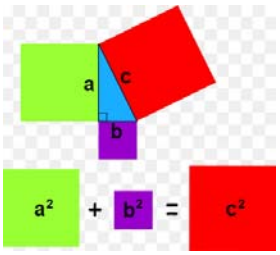



Area A → 10 x 2 = 20
Area B → 4 x 7 = 28
A + B = **48cm²**




### Pythagoras

Used only in right angled triangle to find missing lengths using other lengths




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

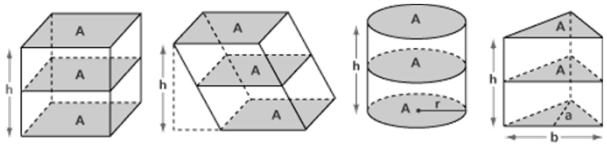
Longest side
1) Square
2) Add
3) Square root

Shortest side
1) Square
2) Subtract
3) Square root

### Volume - prisms

Is the space inside a 3D shape

A prism has a constant cross section, work out its area and multiply by length

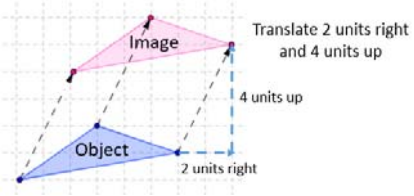



### Transformations

In geometry, transformation refers to the movement of objects in the coordinate plane. The four types are: translation, reflection, rotation and enlargement.

### Translation

"Translation" simply means moving without rotating, resizing or anything else,

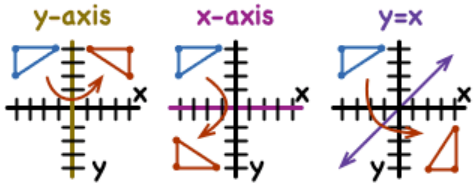



Column vectors

$\begin{pmatrix} -\leftrightarrow + \\ + \\ \updownarrow \\ - \end{pmatrix}$

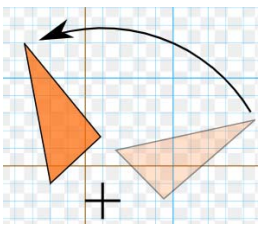
### Reflection

"Reflection" is where a shape is flipped over a reflection line to produce an image



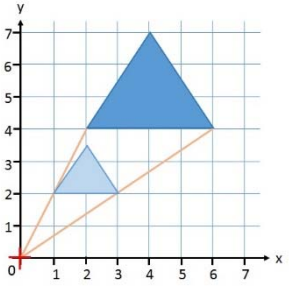

### Rotation

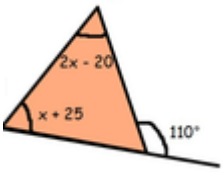
"Rotation" is a circular movement. It has a central point that stays fixed and everything else moves around that point in a circle



### Enlargement

"Enlargement" sometimes called scaling or dilation, is a kind of transformation that changes the size of an object



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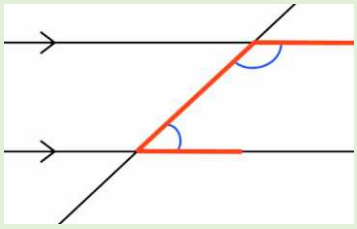
**Co-interior angles add to 180°**



$3x + 85 = 180$

$-85$ $-85$

$3x = 95$

$\div 3$ $\div 3$

$x = \frac{95}{3}$

$\div 2$ $\div 2$