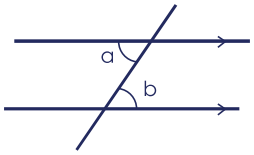
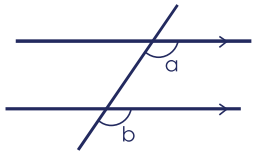
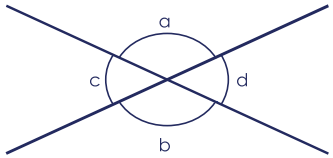
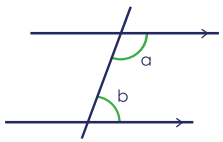
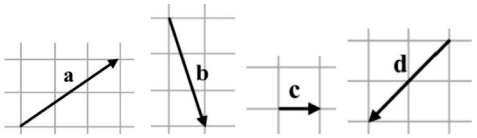
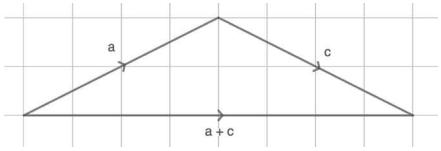
KPI 9.17 Interior and Exterior Angles

1) Polygon	A polygon is a two-dimensional shape with 3 or more straight sides. A polygon is either regular or irregular: Regular – side lengths are equal, and all angles are equal. Irregular – side lengths are unequal, and angles are unequal.		
2) 3 sides	Triangle	**3) 4 sides**	Quadrilateral
4) 5 sides	Pentagon	**5) 6 sides**	Hexagon
6) 7 sides	Heptagon	**7) 8 sides**	Octagon
8) 9 sides	Nonagon	**9) 10 sides**	Decagon
10) 11 sides	Hendecagon	**11) 12 sides**	Dodecagon
12) Exterior Angles	Exterior angles of polygons sum to 360°. An exterior angle of a regular polygon is found by calculating $\frac{360}{n}$.n is the numebr of sides.	**13) Interior Angles**	In a regular polygon. Interior Angle + Exterior Angle = 180°
14) Tessellation	A pattern created with identical shapes that fit together with no gaps.		

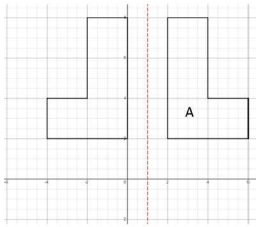
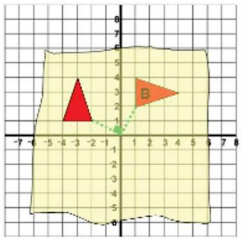
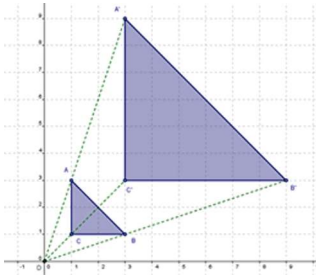
KPI 9.18 Parallel Lines

1) Alternate angles	Alternate angles are equal, so a = b 	**2) Corresponding angles**	Corresponding angles are equal, so a = b 
3) Vertically opposite angles	Vertically opposite angles are equal, so, a = b and c = d 	**4) Co-interior angles**	Co-interior angles sum to 180°, so a + b = 180° 

KPI 9.19 Basic Vectors

1) Vector	Vectors represent movement of a certain size in a certain direction, they are represented on a diagram with an arrow.		
2) Magnitude	Magnitude is defined as the length of a vector.	**3) Scalar**	A scalar is the number we multiply a vector by.
4) Column vector	$\begin{pmatrix} a \\ b \end{pmatrix}$	a: movement along the x-axis (left/right) b: movement along the y-axis (up/down)	
5) Adding and subtracting column vectors	$\begin{pmatrix} a \\ b \end{pmatrix} + \begin{pmatrix} c \\ d \end{pmatrix} = \begin{pmatrix} a+c \\ b+d \end{pmatrix}$	**6) Multiplying vectors**	To multiply a column vector by a number, we multiply both values in the vector by that number.
7) Resultant vectors	The resultant vector is the vector that results from adding two or more vectors together.		
8) Parallel vectors	Travel in the same or opposite direction. Can be of varying lengths. Must be scalar multiples of one another.	The vectors $\begin{pmatrix} 8 \\ 12 \end{pmatrix}$ and $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$ are parallel because $\begin{pmatrix} 8 \\ 12 \end{pmatrix} = 4\begin{pmatrix} 2 \\ 3 \end{pmatrix}$	

KPI 9.20 Transformations

1) Transformations	There are four types of transformations Reflection Rotation Enlargement Translation	**2) Object**	This is the original shape used to perform the transformation on
3) Image	This is the new shape created as the result of the transformation.	**4) Congruent**	Two (or more) shapes that are the same size and the same shape.
5) Reflection	A shape is reflected in a line of symmetry. When a shape is reflected the image is always congruent to the object. The line of symmetry used must be given/or found using an equation. An object and its image are always the same perpendicular distance from the line of symmetry. E.g. Reflect shape A in the line x=1 	**6) Rotation**	When rotating a shape we must have 3 pieces of information. Centre of rotation given as a coordinate (x,y) Angle of rotation (usually 90°,180°,270°) Direction (clockwise or anticlockwise) 
7) Enlargement	When enlarging a shape we must have two pieces of information. Centre of enlargement given as a coordinate (x,y) Scale factor 	**8) Translation**	A translation is a movement of an object When a shape in translated the image is congruent to the object. Translations are described using column vectors (a ¦ b) a: movement along the x-axis (left or right) b: movement along the y-axis (up or down) E.g. Translate the original triangle ABC by the vector (6 ¦ (– 4))