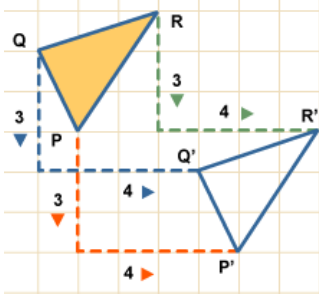
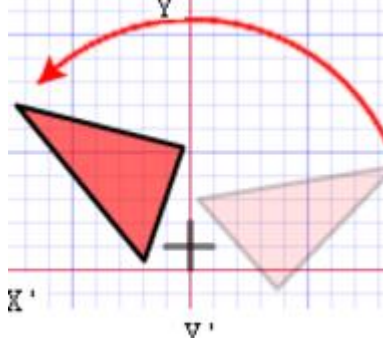
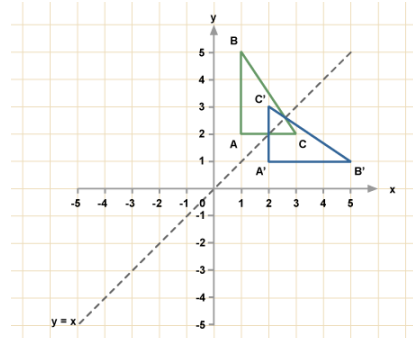
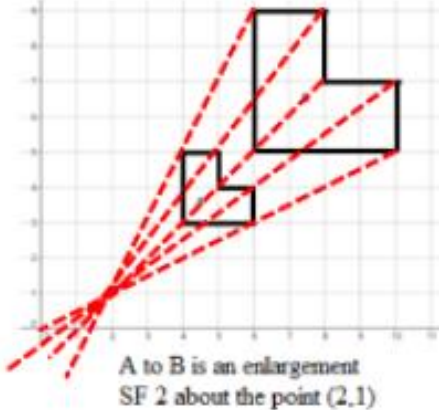
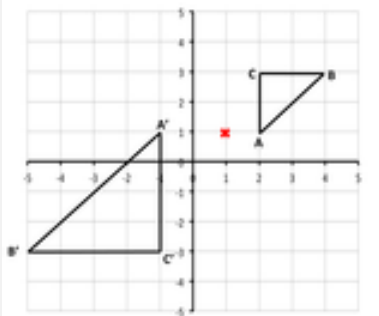
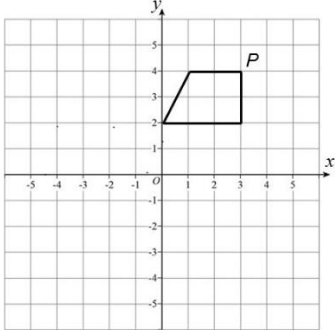
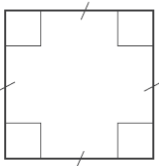
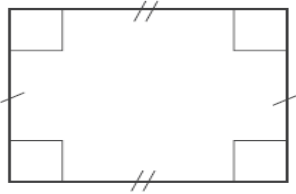
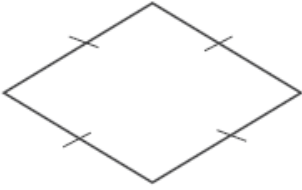
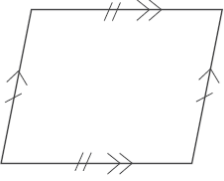
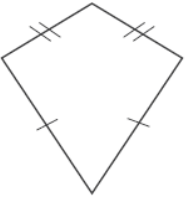


Topic: Transformations

Topic/Skill	Definition/Tips	Example
1. Translation	Translate means to move a shape . The shape does not change size or orientation .	
2. Column Vector	In a column vector, the top number moves left (-) or right (+) and the bottom number moves up (+) or down (-)	$\begin{pmatrix} 2 \\ 3 \end{pmatrix}$ means '2 right, 3 up' $\begin{pmatrix} -1 \\ -5 \end{pmatrix}$ means '1 left, 5 down'
3. Rotation	The size does not change, but the shape is turned around a point . Use tracing paper.	Rotate Shape A 90° anti-clockwise about (0,1) 
4. Reflection	The size does not change, but the shape is ' flipped ' like in a mirror . Line $x = ?$ is a vertical line . Line $y = ?$ is a horizontal line . Line $y = x$ is a diagonal line .	Reflect shape C in the line $y = x$ 
5. Enlargement	The shape will get bigger or smaller . Multiply each side by the scale factor .	Scale Factor = 3 means '3 times larger = multiply by 3' Scale Factor = $\frac{1}{2}$ means 'half the size = divide by 2'

6. Finding the Centre of Enlargement	Draw straight lines through corresponding corners of the two shapes. The centre of enlargement is the point where all the lines cross over. Be careful with negative enlargements as the corresponding corners will be the other way around.	
7. Describing Transformations	Give the following information when describing each transformation: Look at the number of marks in the question for a hint of how many pieces of information are needed. If you are asked to describe a ‘transformation’, you need to say the name of the type of transformation as well as the other details.	- Translation, Vector - Rotation, Direction, Angle, Centre - Reflection, Equation of mirror line - Enlargement, Scale factor, Centre of enlargement
8. Negative Scale Factor Enlargements	Negative enlargements will look like they have been rotated. $SF = -2$ will be rotated, and also twice as big.	Enlarge ABC by scale factor -2, centre $(1,1)$ 
9. Invariance	A point, line or shape is invariant if it does not change/move when a transformation is performed. An invariant point ‘does not vary’.	If shape P is reflected in the $y - axis$, then exactly one vertex is invariant. 

1. Square	• Four equal sides • Four right angles • Opposite sides parallel • Diagonals bisect each other at right angles • Four lines of symmetry • Rotational symmetry of order four	
2. Rectangle	• Two pairs of equal sides • Four right angles • Opposite sides parallel • Diagonals bisect each other, not at right angles • Two lines of symmetry • Rotational symmetry of order two	
3. Rhombus	• Four equal sides • Diagonally opposite angles are equal • Opposite sides parallel • Diagonals bisect each other at right angles • Two lines of symmetry • Rotational symmetry of order two	
4. Parallelogram	• Two pairs of equal sides • Diagonally opposite angles are equal • Opposite sides parallel • Diagonals bisect each other, not at right angles • No lines of symmetry • Rotational symmetry of order two	
5. Kite	• Two pairs of adjacent sides of equal length • One pair of diagonally opposite angles are equal (where different length sides meet) • Diagonals intersect at right angles, but do not bisect • One line of symmetry • No rotational symmetry	
6. Trapezium	• One pair of parallel sides • No lines of symmetry • No rotational symmetry Special Case: Isosceles Trapeziums have one line of symmetry.	