Section 1: Matrices and transformations

Crucial points

1. **Make sure that you are familiar with the matrices for simple transformations**
   You need to know the matrices for reflection in the x axis, the y axis and the lines $y = x$ and $y = -x$, and the matrices for rotation through 90° or 180° about the origin. All these look a bit similar, with 0s, 1s and –1s, so make sure that you can work out what they are with a quick diagram if you're not sure.

2. **Make sure that you are also familiar with the matrices for enlargement and two-way stretches**
   These are quite easy to remember, with the numbers on the leading diagonal giving you the scale factors, and zeros in the other two positions.

3. **Make sure that you know the general rotation matrix**
   The matrix for a rotation of θ anticlockwise about the origin is
   $\begin{pmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{pmatrix}$, and that you can recognise it even if $\cos\theta$ and/or $\sin\theta$
   are negative. Check that you can find the angle of rotation from the matrix, including cases where the angle is not in the first quadrant.

4. **Remember the useful result about the columns of a matrix**
   The image of the point I (1, 0) gives the first column of the matrix, and the image of the point J (0, 1) gives the second column of the matrix.

5. **Make sure you multiply matrices in the correct order for composite transformations**
   Remember that "transformation **A** followed by transformation **B**" is represented by the matrix **BA**.