|  |
| --- |
| **Enlargements Using Matrices** |
| **(a)** | **(b)** | **(c)** |
| By considering the unit square, determine the matrix which describes an enlargement about the origin with scale factor $3$.  | Describe fully the single transformation represented by the matrix $\left(\begin{matrix}\frac{5}{2}&0\\0&\frac{5}{2}\end{matrix}\right)$  | Use matrix algebra to show that an enlargement of scale factor $2$ about $(0, 0)$, followed by an enlargement of scale factor $1.5$ about $(0, 0)$ is equivalent to an enlargement of scale factor $3$ about $(0, 0)$. |
| **(d)** | **(e)** | **(f)** |
| The point $(-5, 3)$ is mapped onto the point $(a, b)$ when enlarged by a scale factor $2$ about the origin. Using matrix algebra, find the values of $a$ and $b$. | The unit square OABC with coordinates O(0, 0), A(0, 1), B(1, 1) and C(1, 0) is mapped to OA’B’C’ under matrix $\left(\begin{matrix}-5&0\\0&-5\end{matrix}\right)$. Use matrix algebra to find the coordinates of A’, B’ and C’. | The point $(c, d)$ is mapped onto the point $(-1, -4)$ when enlarged by a scale factor $0.5$ about the origin. Using matrix algebra, find the values of $c$ and $d$. |
| **(g)** | **(h)** | **(i)** |
| Use matrix algebra to show that an enlargement of scale factor $2$ about $(0, 0)$, followed by an enlargement of scale factor $-0.5$ about $(0, 0)$ is the same as a rotation of $180°$ about the origin. | The point $(a, 3)$ is mapped to the point $(6, 2a)$ when enlarged with scale factor $b $about the origin. Use matrix algebra to find the possible values of $a$ and $b$. | The point ($x-4$, $y$) is mapped to the point ($2y$, $2x-18.5$) when transformed under the matrix $\left(\begin{matrix}-5&0\\0&-5\end{matrix}\right)$. Find the values of $x$ and $y$. |