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| **Reflections Using Matrices** |
| **(a)** | **(b)** | **(c)** |
| By considering the unit square, determine the matrix which describes a reflection in the $x$-axis.  |  Describe fully the single transformation represented by the matrix $\left(\begin{matrix}0&1\\1&0\end{matrix}\right)$ | By considering the unit square, determine the matrix which describes a reflection in the line $y=-x$.  |
| **(d)** | **(e)** | **(f)** |
| The point $(-4, 2)$ is mapped onto the point $(a, b)$ when reflected in the $x$-axis. Using matrix algebra, find the coordinates $(a, b)$. | The point $(c, d)$ is mapped onto the point $(7, -5)$ when reflected in the line $y=-x$. Using matrix algebra, find the coordinates $(c, d)$. | A triangle with vertices at $(0, 5)$, $(4, 3)$ and $(1, -1)$ is reflected in the line $y=x$. Use matrix algebra to find the coordinates of the vertices of the reflected triangle. |
| **(g)** | **(h)** | **(i)** |
| A triangle with vertices at $(0, 1)$, $(1, 0)$ and $(3, 2)$ is reflected so its vertices map to $(0,-1)$, $(-1, 0)$ and $(-2,-3)$. Find the transformation matrix and the line of reflection. | The point $(-2, a)$ is mapped onto the point $(b, 3)$ following a reflection in the line $x=0$. Use matrix algebra to find the values of $a$ and $b$. | The point $(x, 3x-7)$ is mapped onto the point $(y+3, y)$ following a reflection in the line $y$-axis. Use matrix algebra to find the values of $x$ and $y$. |