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| **Harder Transformations Using Matrices** | | |
| **(a)** | **(b)** | **(c)** |
| Find the single matrix that represents an enlargement about the origin with scale factor 3, followed by a rotation of clockwise about the origin. | Find the single matrix that represents a reflection in the y-axis, followed by a rotation of about the origin. | Matrices P and Q represent different transformations. Find the single matrix that represents transformation P followed by transformation Q. |
| **(d)** | **(e)** | **(f)** |
| The point P is mapped to the point Q following a reflection in the line , then an enlargement with scale factor 2 about the origin. Use matrix algebra to find the coordinates of point Q. | The point is mapped to the point following a rotation of about the origin, then a reflection in the x-axis. Using matrix algebra, find the coordinates . | The matrix maps the point onto the point . Use matrix algebra to find the values of and . |
| **(g)** | **(h)** | **(i)** |
| The transformation matrix maps the point to the point . Find the values of and . | The transformation matrix maps the point to the point . Find the values of and . | Point is mapped to the point by the transformation matrix . Use matrix algebra to find the two possible values of and . |