Rotations, reflections and dilations

6 questions | 12 marks

Equivalent correct methods earn the corresponding marks.

1. Give the matrix for reflection in the y-axis. [2 marks]

Change the x sign but keep y.

Answer: $\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$.

2. Rotate $(1, 2)$ through 90° clockwise. [2 marks]

Use (x, y) to $(y, -x)$.

Answer: $(2, -1)$.

3. Give the matrix for dilation of factor -2. [2 marks]

Multiply both coordinates by -2.

Answer: $\begin{pmatrix} -2 & 0 \\ 0 & -2 \end{pmatrix}$.

4. Reflect $(3, -1)$ in $y = x$. [2 marks]

Swap the coordinates.

Answer: $(-1, 3)$.

5. Rotate $(2, 0)$ through 60° counterclockwise using exact values. [2 marks]

Use $2\cos 60^\circ = 1$ and $2\sin 60^\circ = \sqrt{3}$.

Answer: $(1, \sqrt{3})$.

6. Describe the transformation $\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$. [2 marks]

It sends (x, y) to $(-y, -x)$.

Every point $(t, -t)$ on that mirror line is fixed.

Answer: Reflection in $y = -x$.