

2

$$\mathbf{A} = \begin{pmatrix} 1 & \frac{3}{2} \\ 0 & 1 \end{pmatrix} \text{ and } \mathbf{B} = \begin{pmatrix} 1 & 0 \\ \frac{3}{2} & 1 \end{pmatrix}.$$

- (a) Give full details of the geometrical transformation in the x - y plane represented by $\mathbf{A}$. [2]

- (b)** Give full details of the geometrical transformation in the x - y plane represented by **B**. [2]

[illegible]

The triangle DEF in the x - y plane is transformed by $\mathbf{AB}$ onto triangle PQR .

- (c) Show that the triangles DEF and PQR have the same area. [2]

This image shows a full page of white paper with ten evenly spaced horizontal dashed lines, typical of primary school handwriting practice paper. The lines extend across the entire width of the page.

- (d)** Find the equations of the invariant lines, through the origin, of the transformation in the x - y plane represented by **AB**. [5]

[illegible]

4

$$\mathbf{A} = \begin{pmatrix} 0 & 1 \\ -1 & 1 \\ 1 & 1 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} k & 0 \\ 0 & m \end{pmatrix} \text{ and } \mathbf{C} = \begin{pmatrix} 2 & -1 & 1 \\ 1 & 1 & 2 \end{pmatrix}.$$

- (a) Give full details of the geometrical transformation in the x - y plane represented by the matrix $\mathbf{B}$ in each of the following cases.

- (i) $m = 1$ [2]

- (ii) $m = k$ [2]

- (b) Show that the matrix $\mathbf{ABC}$ is singular. [6]

This image shows a full page of white paper with horizontal dashed lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

This image shows a full page of a worksheet designed for handwriting practice. It consists of approximately 20 evenly spaced horizontal dotted lines across the entire page, providing a guide for letter height and placement. The background is plain white, and there are no other markings or text present.

4

- (a)**

[2]

[illegible]

- (b)

[illegible]

- 1**

(a)

[4]

- (b)**

[5]

[illegible]

The unit square S in the x - y plane is transformed by $\mathbf{M}$ onto the rectangle P .

- (c) Find the matrix which transforms P onto S . [2]

[illegible]