

**Question**

Find the matrix which describes the following transformation:

- (i) a rotation about the origin through  $\frac{\pi}{3}$ ,
- (ii) a reflection in the y-axis,
- (iii) a reflection in the straight line passing through the origin and (1,1).

**Answer**

$$(i) \begin{pmatrix} \frac{1}{2} & -\frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{pmatrix}$$

$$(ii) \begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$$

$$(iii) \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$$