

2x2 MATRIX TRANSFORMATIONS

EXERCISE 1: State what reflection the following matrices correspond to

a) $\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$

b) $\begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}$

c) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

d) $\begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}$

EXERCISE 2: Plot the following points in the x-y plane, and then reflect in the x-axis (showing the multiplication)

a) $A = (2, 2)$ $B = (2, 3)$

$C = (3, 2)$ $D = (3, 3)$

b) $A = (-4, -10)$ $B = (-4, -6)$

$C = (-8, -10)$ $D = (-8, -6)$

EXERCISE 3: State what effect the following rotation matrices would have (angle and direction)

a)
$$\begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$$

b)
$$\begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}$$

c)
$$\begin{bmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \\ -\frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{bmatrix}$$

EXERCISE 4: State the scale factor for length and scale factor for area in the following

a)
$$\begin{bmatrix} 2 & 0 \\ 0 & 2 \end{bmatrix}$$

b)
$$\begin{bmatrix} -4 & 0 \\ 0 & -4 \end{bmatrix}$$