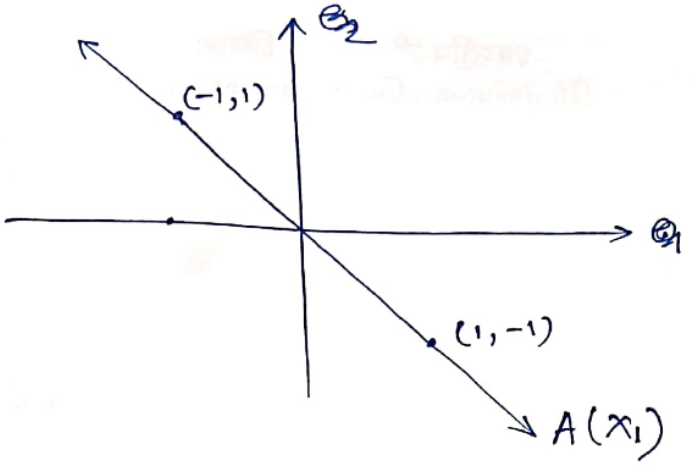
So, A



Now, for $A = \begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix}$ and $x \in X_2$

$$X_2 = \{ x \mid x_1 - x_2 = 1,\ x \in \mathbb{R}^2 \}$$

$$= \{ x = (x_1, x_1 - 1) : x_1 \in \mathbb{R} \}$$

$$\therefore Ax = \begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_1 - 1 \end{bmatrix} = \begin{bmatrix} x_1 - (x_1 - 1) \\ x_1 + (x_1 - 1) \end{bmatrix} = \begin{bmatrix} 1 \\ 2x_1 - 1 \end{bmatrix}$$

$\forall x_1 \in X_2$

$$A(X_2) = \{ (1, 2x_1 - 1) : x_1 \in \mathbb{R} \}$$

$$= \{ (1, 2t - 1) : t \in \mathbb{R} \}$$

So,