

MATH 54 – SOLUTION TO 1.9.9

PEYAM TABRIZIAN

All you need to determine is what happens to $(1, 0)$ and $(0, 1)$:

If you reflect the point $(1, 0)$ through the x_1 -axis, then you get $(1, 0)$ (nothing happens), and if you rotate $(1, 0)$ by $-\frac{\pi}{2}$ radians, you get $(0, -1)$, and hence:

$$T \begin{bmatrix} 1 \\ 0 \end{bmatrix} = \begin{bmatrix} 0 \\ -1 \end{bmatrix}$$

If you reflect the point $(0, 1)$ through the x_1 -axis, then you get $(0, -1)$, and if you rotate $(0, -1)$ by $-\frac{\pi}{2}$ radians, you get $(-1, 0)$, and hence:

$$T \begin{bmatrix} 0 \\ 1 \end{bmatrix} = \begin{bmatrix} -1 \\ 0 \end{bmatrix}$$

And putting the two columns together, you get that the matrix of T is A , where:

$$A = \begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix}$$