If P is a 3×3 matrix such that $P^T = 2P + I$, where P^T is transpose of P and I is the 3×3 identity matrix, then there exists a column matrix $X = \begin{bmatrix} x \\ y \\ z \end{bmatrix} \neq \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$ such that

Solution: $P^T = 2P + I$

$P = 2P^T + I$

$= 4P + 3I$

$\Rightarrow P = -I$

$PX = -X$

A $PX = X$

B $PX = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$

C $PX = -X$

D $PX = 2X$

Return To Top