

Matrices – Q12: Eigenvectors [Problem/H](2/6/21)

Prove that if M is orthogonally diagonalisable, then M is symmetric.

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Solution

If M is orthogonally diagonalisable, then $M = PDP^{-1}$, where $P^{-1} = P^T$.

Then $M^T = (PDP^{-1})^T = (P^{-1})^T D^T P^T = PDP^{-1} = M$,

so that M is symmetric.