

The Square root of 2x2 Matrices

Ihab AL Tamimi

Department of Mathematics, Palestine Polytechnique University,
Palestine

Abstract:

In this study we introduce a new method for finding the square root of a 2x2 matrix A using Cayley-Hamilton theorem, provided that the matrix A has distinct eigenvalues (diagonalizable) and it is positive definite or semi-positive definite.

Also we introduce a general form for $(\sqrt{A})^n$ where $n \in \mathbb{N}$, with its proof in two ways, the new thing here is when n is even the result is true by Cayley-Hamilton theorem. If we have a square matrix A such that $A.A = B$, then we say that the square root of the matrix B is the matrix A . i.e $\sqrt{B} = A$, where two matrices A and B have the same order.