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Master Structural Mechanics and Coupled Systems

Applied Mathematics

Student presentation 1 (course 07)

- Square root of a positive definite matrix

Let $n \geq 1$ an integer and A a real symmetric positive definite matrix of order n.

a) Recall the principal properties relative to such a matrix.

b) Construct a real symmetric positive definite matrix S such that $S.S = A$.

c) Why the denomination of "square root" of the matrix A is appropriate ?

d) Evaluate the matrix S when $A = \begin{pmatrix} 2 & -1 \\ -1 & 2 \end{pmatrix}$.

e) Show that there exists other matrices S' such that $S'.S' = A$.