Stack of Lessons in Mechanics

Some Mathematical Preparation

(Monitor Friendly Version)

A. K. Kapoor

http://0space.org/users/kapoor

akkapoor@cmi.ac.in; akkhcu@gmail.com

Stack Outline

Syllabus

Vector algebra Preliminaries: Kronecker delta and LeviCivita symbol; Einstein summation convention. 123 notation for vector components. Dot and cross products of two vectors and vector identities.

Prerequisites

Vector algebra; dot and cross products; Triple product; Geometrical representation; Components of a vector in a system of coordinate axes; Vector algebra identities; Direction cosines; Matrix algebra; Determinants and their properties.

Lessons

1. A Quick Review of Vector Algebra

2. Summation Convention, ϵ, δ symbols and All That

References

Following is an incomplete list of reference for reading on introductory and specialized range of topics in matrices and vector analysis.

1. Shanti Narayan, *A Text Book of Matrices*, Revised by P. K. Mittal, S. Chand and Co, Delhi (2010)

2. Andrilli S. and Hecker D., *Elementary Linear Algebra*, Academic Press, California USA Fourth edition (2010)

3. Bellman R.,*Introduction to Matrix Analysis*, Textbook Publishers (2003)

4. Khan Academy :: Introduction to matrices
   https://www.khanacademy.org/math/algebra-home/alg-matrices

5. Emma Thomas, Matrices and Determinants
   http://www.maths.surrey.ac.uk/explore/emmaspages/option1.html
   A page developed for The University of Surrey, England.

6. Murphy G. M. and Margenau H. *The Mathematics of Physics and Chemistry*,
   Van Nostrand (1967).

7. Spain B., *Vector Analysis*, Van Nostrand Reinhold (1967).

Lesson A-1 :: Quick Review of Vectors

Lesson A-2 :: Summation Convention, ϵ, δ symbols and All That

---

Some Suggested activities to appear here