

PHYS3122A Homework 1, due Friday 08/28/2009 at 5pm:

- 1) Solve problems: 1.3, 1.7, 1.9, 1.12, 1.15, 1.18, 1.21a, 1.16, 1.27
- 2) A transformation is given by a 3x3 matrix R_{ij} . A vector \mathbf{A} under this transformation is transformed into vector \mathbf{A}' according to

$$A'_i = \sum_{j=1}^3 R_{ij} A_j$$

where 1 stands for x -component, 2 stands for y -component and 3 stands for z -component.

Show that if the transformation is a rotation (length is preserved, $|\mathbf{A}| = |\mathbf{A}'|$) then $R^T R = I$. Here I is the identity matrix and R^T is the transposed matrix of R .