

MEEG 4703 Quiz #1

1. (10 pts) Derive the transformation law for first-order tensors:

$$A_i = a_{ji} A'_j$$

2. (10 pts) Making use of the laws of transformation for Cartesian tensors, prove the orthonormal condition that

$$a_{ik} a_{jk} = \delta_{ij}$$

3. (10 pts) Using index notation, prove the identity that

$$\mathbf{A} \cdot (\nabla \times \mathbf{B}) = \nabla \cdot (\mathbf{B} \times \mathbf{A}) + \mathbf{B} \cdot (\nabla \times \mathbf{A})$$
