Date
21/08/2020

Assignment 4 (MA31007)

(Mathematical Methods)

Q1) Prove that the equations of transformation of a mixed tensor possess the group property (or, transitive property).

Q2) Prove that the tensor product of the tensors of the type (r,s) & (r',s') is a tensor of the type $(r+r', s+s')$.

Q3) Prove that the open product of two vectors is a tensor of order two. Is the converse true?

Q4) Show that the outer product of two tensors is a tensor whose order is the sum of the orders of the two tensors.

Q5) Show that the inner product of the tensors A^{p}_{M} & B^{MS}_{t} is a tensor of rank three.

Q6) Show that the number of independent components g_{ij} of the metric tensor cannot exceed $\frac{1}{2}n(n+1)$. (here g_{ij} is the fundamental tensor)

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