

MECH 503 Homework 1

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1 Question 1

(a)

$$\nu_i u_i = \sum_{i=1}^n \nu_i u_i$$

(b)

$$\delta_{ii} = \sum_{i=1}^n \delta_{ii} = n$$

(c)

$$\nu_{i,i} = \sum_{i=1}^n \frac{\partial \nu_i}{\partial x_i}$$

(d)

$$\delta_{ij,j} = \sum_{j=1}^n \frac{\partial \delta_{ij}}{\partial x_j} = 0$$

(e)

$$\epsilon_{ijk} v_j u_k = \sum_{j=1}^n \sum_{k=1}^n \epsilon_{ijk} v_j u_k$$

(f)

$$\delta_{mi} \delta_{mj} T_{ij} = \sum_{i=1}^n \sum_{j=1}^n \delta_{mi} \delta_{mj} T_{ij} = T_{mm}$$

(g)

$$Q_{ij}T_{ik}Q_{km} = \sum_{j=1}^n \sum_{k=1}^n Q_{ij}T_{ik}Q_{km}$$

(h)

$$\epsilon_{ijk}\sigma_{jk} = \sum_{j=1}^n \sum_{k=1}^n \epsilon_{ijk}\sigma_{jk}$$