

CE 525 Exam #1

October 01, 2026

NCSU Honor Code: I have neither given nor received any unauthorized help on this exam.

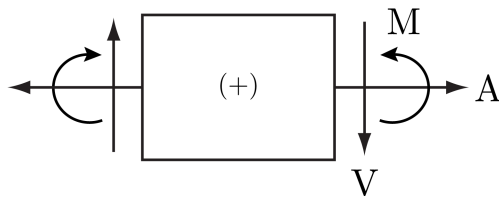
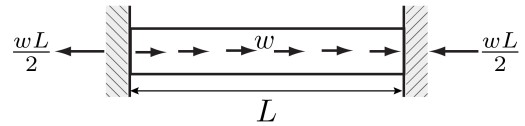
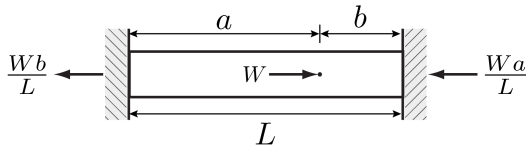
Name: _____

Signature: _____

$$[k]_{\text{uniaxial}} = \frac{EA}{L} \begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix} \quad [k]_{\text{truss}(2D)} = \frac{EA}{L} \begin{bmatrix} 1 & 0 & -1 & 0 \\ 0 & 0 & 0 & 0 \\ -1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix} \quad [T]_{\text{truss}(2D)} = \begin{bmatrix} c & s & 0 & 0 \\ -s & c & 0 & 0 \\ 0 & 0 & c & s \\ 0 & 0 & -s & c \end{bmatrix}$$

$$[k]_{\text{truss}(3D)} = \frac{EA}{L} \begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix} \quad [T]_{\text{truss}(3D)} = \begin{bmatrix} \cos\theta_x & \cos\theta_y & \cos\theta_z & 0 & 0 & 0 \\ 0 & 0 & 0 & \cos\theta_x & \cos\theta_y & \cos\theta_z \end{bmatrix}$$

$$[k]_{\text{FEM}} = \int_V B^T E B dV \quad \bar{u}_x = \sum_{i=0}^n a_i x^i \quad \bar{u} = [N] \{u\}$$



Positive forces/moments
(drawing diagrams)

You must show all work to get credit for a problem