FINITE ELEMENT ANALYSIS
Test 1 Make Up (Work out Two out of 3)
Maximum additional points int[45(1-x/100)]

1. The figure shows a bar which is made of 1.5 in diameter steel rod with a snugly fitting brass sleeve of outer diameter 2 in. If a compressive load of 5000 lb is applied as shown, determine the deflection and stresses in the rod and sleeve. $E_{steel} = 30 \times 10^6$ psi, $E_{brass} = 15 \times 10^6$ psi.

2 in   1.5 in

Fixed   5000 lb

10in
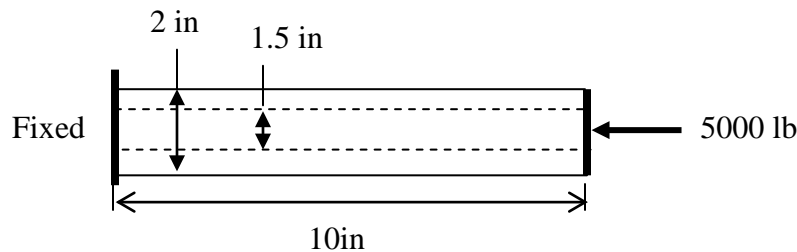
2. Solve the two bar structure problem using truss elements. Find deflection at load and stress in the elements. (Use symmetry in your formulation)

2kN

300mm

400mm   400mm

$E = 100$ MPa
$A = 250$ mm^2
for both members
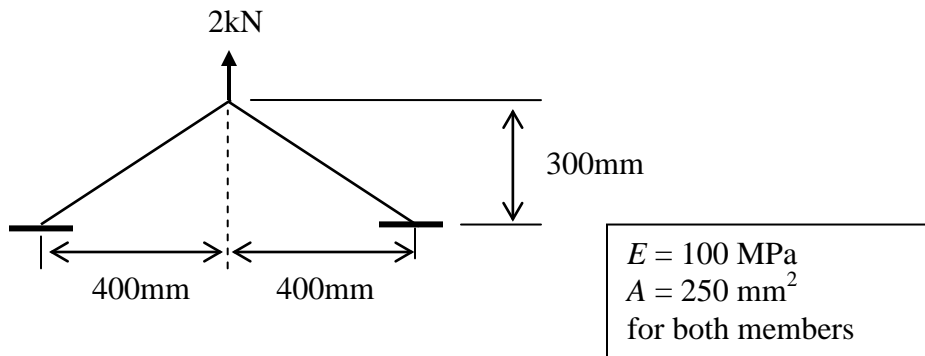
3. For the beam shown, determine the slope at the pin support in radians. Use asymmetry and solve using one beam element.

2 N-m

Fixed

1m   1m

Fixed

$E = 1$ Pa
$I = 1$ m^4