HW 2: Due Thurday Feb 12

1. Consider the system shown in probelm SG 2.24. Assume that $L = 1$ m, $E = 200$ GPa, and that the bar is round with radius 5 cm. Let the spring constant be $k = 1500$ kN/mm. Assume a distributed load $b(x) = 100 \exp[x/L]$ (kN/mm). Use your program from the lab to determine the displacement at $x = L$ and the maximum stress in the bar.

2. Consider the system shown in problem SG 8.20. Assume that $L = 3$ ft, $a = 1$ ft, and that $EI = 120 \times 10^6$ lbf/in^2. Utilize your program from the lab to determine the torsional stiffness at the point of application of the load; i.e. determine $k_T = S/\theta(a)$.

3. Consider the truss shown below. Write out the governing equilibrium equations for the truss in $\boldsymbol{A}^T \boldsymbol{F} = \boldsymbol{F}_{\text{applied}}$ form.

50 kN

2 m

2 m   2 m