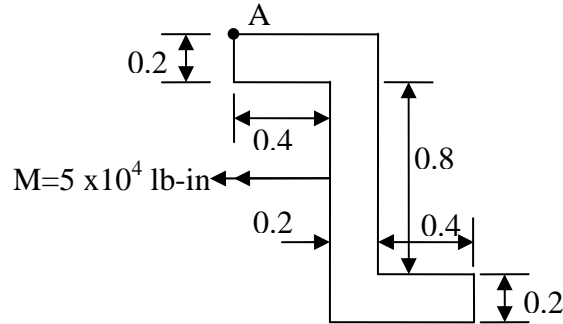
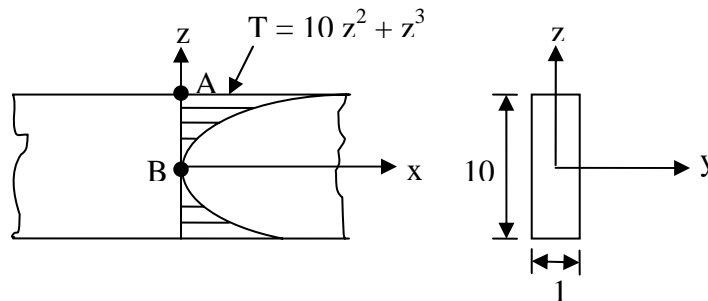


AE 670 Aerospace Structural Analysis-I
Assignment No. 6

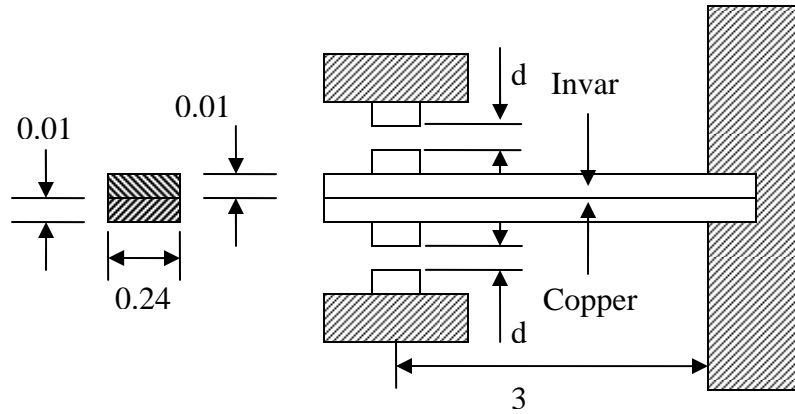
6.1 Find the bending stress at point A if the Z section is subjected to the bending moment shown.



6.2 The rectangular beam shown is subjected to a temperature change $T = 10z^2 + z^3$. Find the stress at points A and B if $\alpha = 10^{-5}$ in. / (in.) ($^{\circ}$ F) and $E = 10^7$ psi.

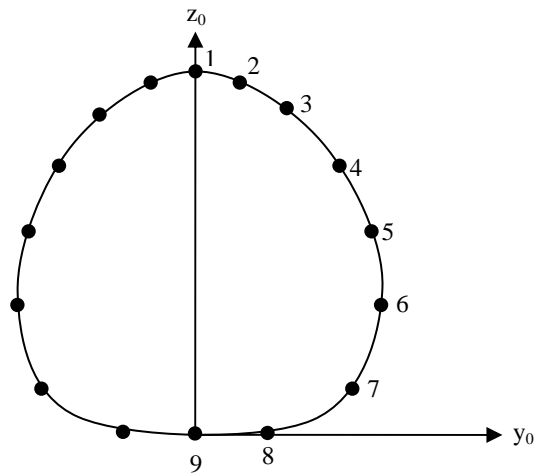


6.3 A bimetallic strip is used in the thermostat, which controls the cabin temperature in a manned space station. The element is of the size and materials shown. Find the clearance d , which should be provided to have the contacts close for a temperature variation of $\pm 10^{\circ}$ F if the strip is straight at 72° F. For invar $\alpha = 1.1 \times 10^{-6}$ in. / (in.) ($^{\circ}$ F), $E = 21 \times 10^6$ psi; and for copper $\alpha = 9.5 \times 10^{-6}$ in. / (in.) ($^{\circ}$ F), $E = 17 \times 10^6$ psi.



6.4 The idealized fuselage section shown is subjected to a bending moment of 10^{-6} in $-lb$ about a horizontal axis. The effective areas of the longitudinals and their coordinates are given in the following table. Find the stresses in the longitudinals.

Longitudinal	A_i in. ²	y_0 in.	z_0 in.
1	1.0	0.0	60.0
2	0.8	14.0	56.0
3	0.8	20.0	46.0
4	0.8	24.0	35.0
5	0.9	26.0	24.0
6	1.0	27.0	12.0
7	1.0	24.0	4.0
8	1.5	15.0	0.0
9	1.0	0.0	0.0



6.5 A cantilevered Z-section beam with the cross section given in Prob. 6.1 is 10 in.-lb long and is loaded by a vertical force of 300 lb at the tip. Determine the vertical and horizontal components of the tip deflection.