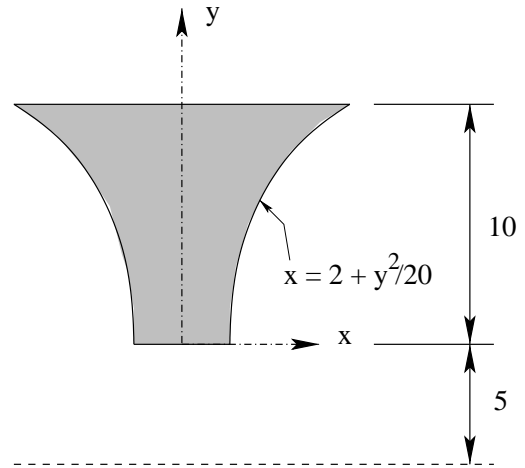
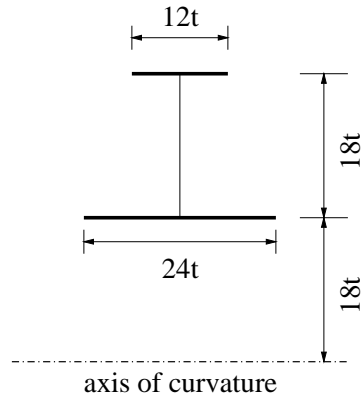


CE 560 Advanced Mechanics of Materials
 PROBLEMS: Bending of curved beams

1. Consider a curved beam with the cross-section shown. Determine the maximum tensile stress and maximum compressive stress for a given bending moment M . Do an exact integration and also a numerical integration using 10 divisions of the cross-section.



2. Given the curved beam shown, determine the location of the N.A. and the maximum flexural stress per unit of Moment. Consider the web offers negligible bending resistance, and that the thickness of the flanges, t , is small enough to create a nearly uniform stress in each. The dimensions shown are to the centerlines. Work this problem by carefully following the steps of the derivation.



3. For problem 2, consider that $t=15\text{mm}$, and that the web thickness is 10mm . Using the analysis you did above, calculate the ratio of the maximum radial stress to that of the maximum flexural stress.
4. Thoroughly explain any possible errors your solution for problem 2 might have.