COVER SHEET
- HW is to be turned in with the cover sheet filled out and signed.
- HW is due before class one week after it is handed out.
- Use the systematic solution technique presented in class.

I have completed this assignment on my own. I did not *copy* the solutions from anyone or any other source.

☐ I collaborated on this assignment with:

_____   _____

_____   _____

_____   _____

☐ I looked at the solutions from other sources after I worked on the problem and made the necessary corrections.

Signature: _____

No member of this class shall take unfair advantage of any other member in this class.

Problem 1.

Figure P3.15 shows a thin cantilever beam of unit thickness carrying a uniform load of intensity p per unit length. Assume that the stress function is expressed by

$$\Phi = ax^2 + bx^2y + cy^3 + dy^5 + ex^2y^3$$

in which $a, \ldots, e$ are constants. Determine (a) the requirements on $a, \ldots, e$ so that Φ is biharmonic; (b) the stresses σ_x, σ_y, and τ_{xy}.
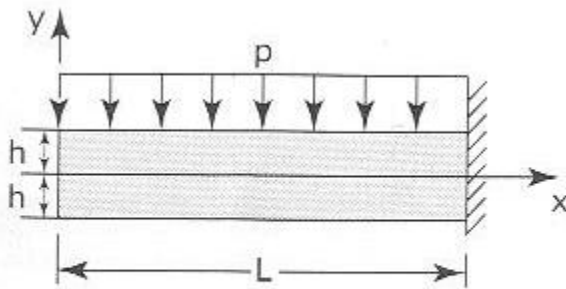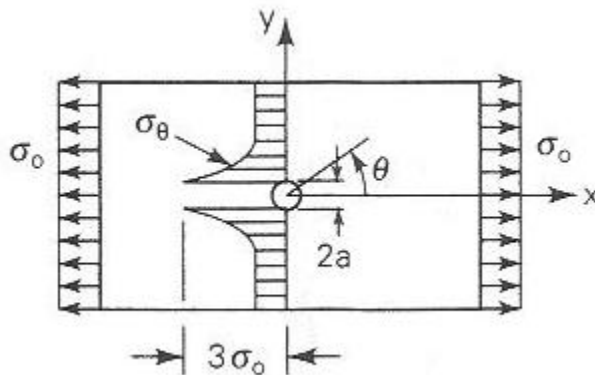

FIGURE P3.15.

Problem 2.
Derive the stresses in a large, thin plate containing a small circular hole of radius a subjected to simple tension. Follow the procedure of Ugural and Fenster, as shown in class, completing the details that were skipped in the notes.

Plot the radial and circumferential stresses along the distance from the center for $\theta=\pi/2$ using Matlab, Mathcad or Excel.