1. Consider the infinite-length wedge subjected to a concentrated line load of P N/m at its vertex as shown (Fig. 1). Using the semi-inverse method, obtain the stresses $\sigma_{rr}, \sigma_{r\theta}, \sigma_{\theta\theta}$ as a function of $r, \theta, P, \alpha, \beta$. Note that in order to obtain the constants of integration, in addition to the usual boundary conditions you will need to consider the free body diagram above section a-b and then enforce an integral boundary condition involving the applied line load and the force due to internal stresses at section a-b.

2. Specialize the result of problem 1 to obtain the stress distribution for a line load acting normally on the straight boundary of a semi-infinite plate (i.e. obtain the given stress distribution of problem 3, tutorial # 3)

3. Re-work problem 1 when a distributed line moment of M Newtons is applied at the vertex as shown (Fig 2). Note that you will have to apply a similar integral boundary condition involving the applied line moment and the moment due to internal stresses at section a-b.
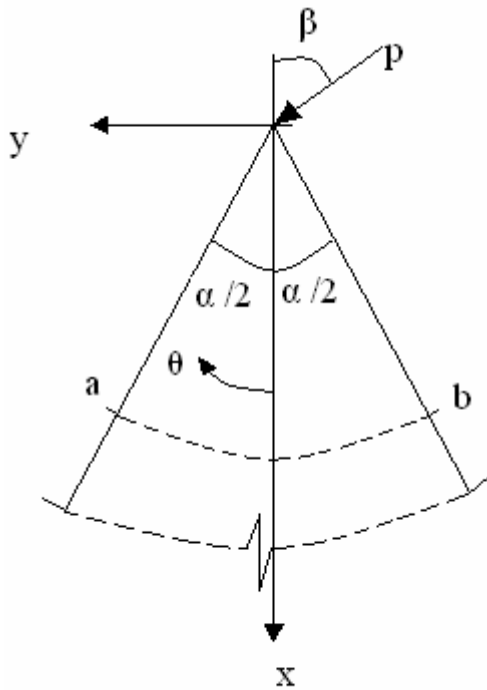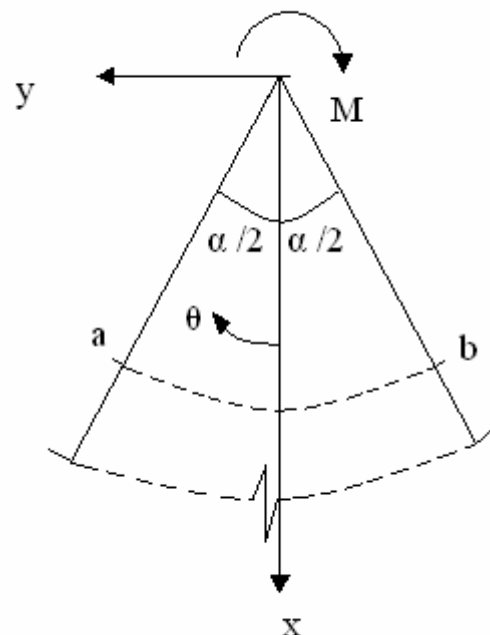

Fig.01   Fig.02