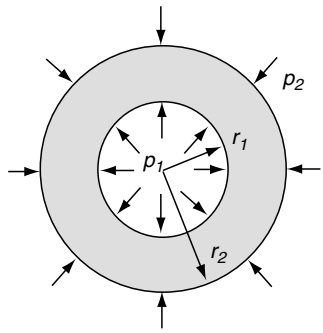
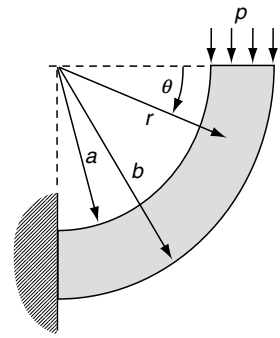
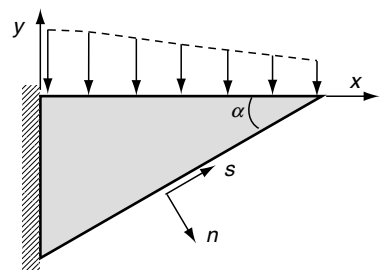


(e)



(f)

5-2. The tapered cantilever beam shown in the following figure is to have zero tractions on the bottom inclined surface. As discussed in the text (see Figure 5-4), this may be specified by requiring $T_x^{(n)} = T_y^{(n)} = 0$. This condition can also be expressed in term of components normal and tangential to the boundary surface as $T_n^{(n)} = T_s^{(n)} = 0$, thus implying that the normal and shearing stress on this surface should vanish. Show that these two specifications are equivalent.



5-3. As mentioned in Section 5.6, Saint-Venant's principle allows particular boundary conditions to be replaced by their statically equivalent resultant. For problems (b), (c), and (d) in Exercise 5-1, the support boundaries that had fixed displacement conditions can be modified to specify the statically equivalent reaction loadings. Develop the resultant loadings over the fixed boundaries for each of these cases.

5-4. Go through the details and explicitly develop the Beltrami-Michell compatibility equations (5.3.3).

5-5. For the displacement formulation, use relations (5.4.1) in the equilibrium equations and develop the Navier equations (5.4.3).

5-6. There has been recent interest in nonhomogenous material behavior related to functionally graded materials. Parameswaran and Shukla (1999) presented a two-dimensional study in which the shear modulus and Lamé's constant varied as