1. A K_{Ic} compact tension specimen with a thickness 4.0 cm is subjected to a nominal stress σ_{nom} elastically in y direction. If σ_{nom} = 200 MPa, K_t (stress concentration factor) at A = 2.0, ν = 0.27, E = 200 GPa, estamate the <u>stress</u> and <u>strain</u> states at location A (Fig. 1).

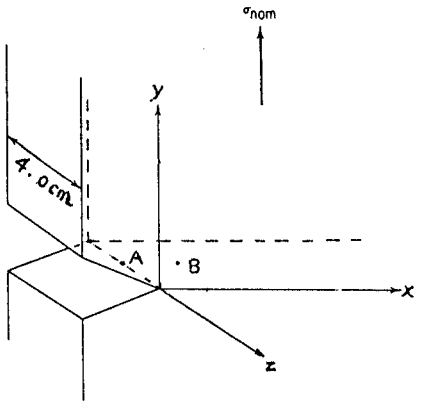


Fig. 1

2. In Fig. 1, B is at a distance 0.5 cm from location A. Draw a Mohr's circle for the <u>stress state</u> at A and B, respectively.
Note: Exact calculation of stress state at B is not necessary, but a reasonable estimation of the magnitude of stress at B (relative to that at A) is still desirable.

3. A 細長的 slender beam (Fig. 2) is subjected to a bending moment M_b. x-z is the neutral plane. Consider an element A at a distance y from the neutral plane. Give the result of σ_x, σ_y, σ_z, τ_{xy}, τ_{xz}, τ_{yz} and ϵ_x, ϵ_y, ϵ_z, γ_{xy}, γ_{xz}, γ_{yz} in terms of M_b, b, h, and E (Young's modulus), ν (Poisson's ratio), etc.

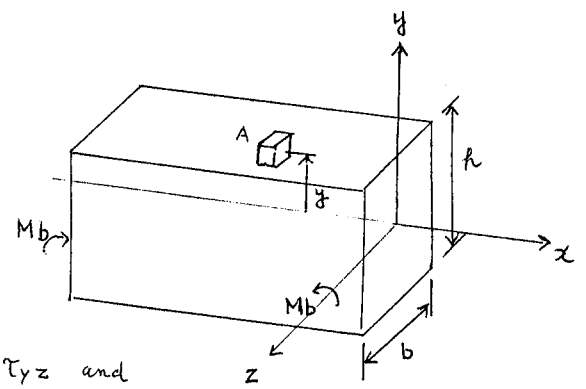
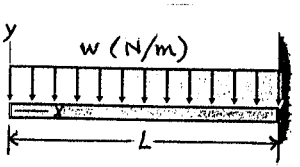


Fig. 2

4. A beam is loaded and supported as shown in Fig. 3. Determine (a) The equation of the elastic curve, (b) The deflection at the left end of the beam. (c) The slope at the left end of the beam.



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