

CE 203 STRUCTURAL MECHANICS I (Section 3)

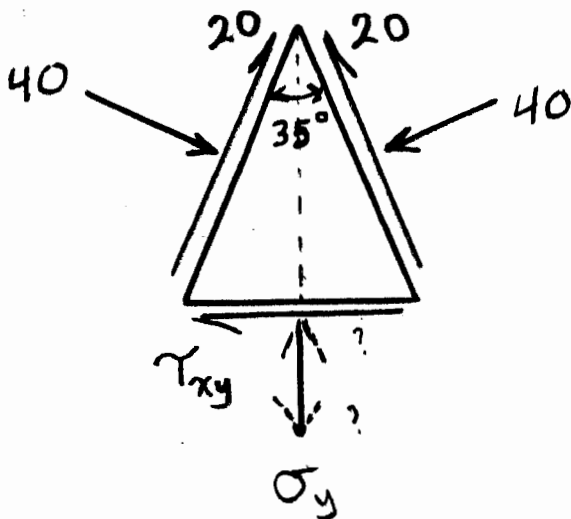
Second Semester 1429 / 2008 (072)

H.W. # 12

Due on Wednesday 23-5-1429 / 28-5-2008 (any time)

Deadline for submission: **Saturday 26-5-1429 / 31-5-2008 (before you sit in class)**

- 1) For the state of stress shown in Fig. P1, determine σ_y , τ_{xy} , σ_{\max} , σ_{\min} , and τ_{\max} .
[Secs. 9.1 – 9.3 + Handout] (15 pts.)
- 2) For the state of stress shown in Fig. P2, use the **equations** to determine
 - a- the magnitude and direction of the **principal normal stresses**; *show then on a properly oriented element.*
 - b- the magnitude and direction of the **maximum (principal) shear stresses**; *show them on a properly oriented element.*
 - c- the **normal and shear stresses on the plane indicated by the dashed line**; *show then on a properly oriented element.*[Secs. 9.1 – 9.3 + Handout] (15 pts.)
- 3) Rework problem 2 above, but using **Mohr's Circle**. [Secs. 9.4 – 9.7 + Handout] (20 pts.)
- 4) **Qualitatively**, sketch the **states of stress and Mohr's circles** for points A to F in the beam shown in Fig. P4. [Secs. 9.4 – 9.7 + Handout] (20 pts.)
- 5) In the beam shown in Fig. P5, use **Mohr's circle to determine the principal normal and shear stresses** and their directions at the point(s) of maximum stresses. [Secs. 9.4 – 9.7 + Handout] (30 pts.)



all in MPa

Fig. P1

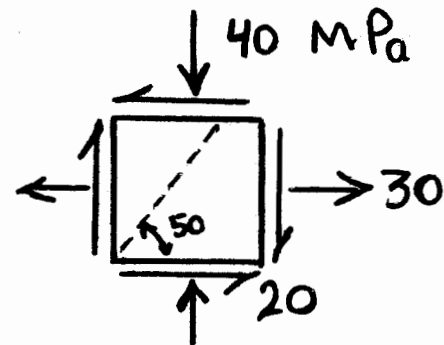


Fig. P2

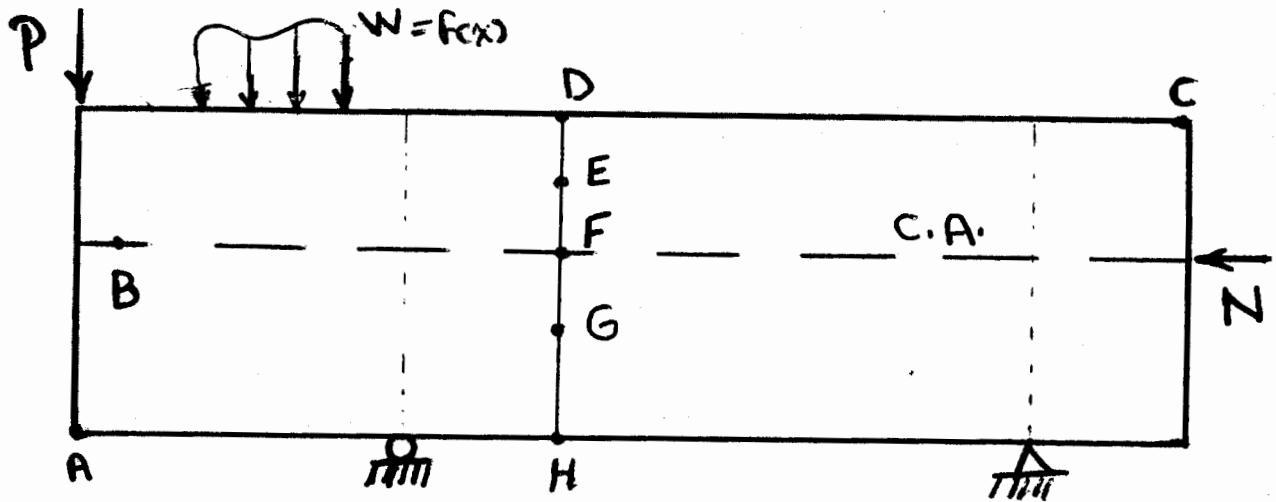
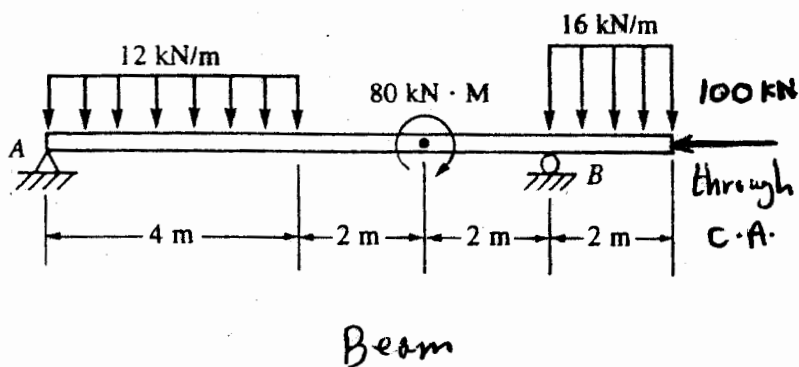


Fig. P 4



Beam

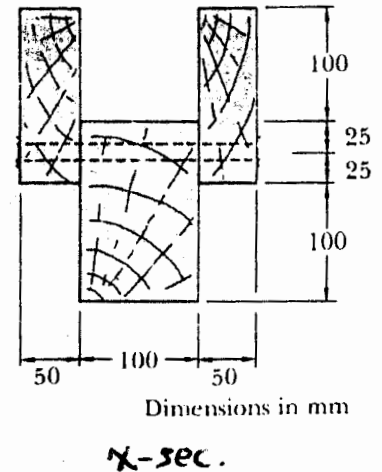


Fig. P 5

Do your work yourself!! Remember that the homework carries 20% of the course grade; in addition, solving it is the best way to understand the subject. Of course, you can seek my help anytime in the homework as well as in anything else.

As an engineer, review the guidelines for submitting homework assignments given to you in class BEFORE you start solving and writing the homework. FOLLOW ALL THESE GUIDELINES. Cheating, copying, etc. is!!!!!!