MASSACHUSETTS INSTITUTE OF TECHNOLOGY
13.10J/1.573J Structural Mechanics
13.014 Materials and Structures
1.052 Mechanics of Structures
Problem Set 8

Assigned : October 25, 2000
Due : November 1, 2000

1. For undergraduate students (1.052) : 11.23, 11.32, 11.76 and 11.90
2. For undergraduate students (13.014) : 11.32, 11.76, 11.90 and the lab problems

   Lab problems

   (a) Calculate the moment of inertia of the I-beam from the definition. Derive the exact expression and simplify it in the case of a thin web and flange.

   (b) From the measured load-deflection relations, find and compare the stiffnesses of the beams.

   (c) Find the equivalent cross-section of the solid section beam so that the weight (per unit length) of the I-beam and rectangular beam be the same.

   (d) Calculate the ratio of the stiffness of the I-beam and the rectangular beam of the same weight.

   (e) (*Extra Credit*) Find the elastic modulus E from the test data.
3. For graduate students (13.10J/1.573J) : 11.23, 11.26, 11.32, 11.76, 11.90 and 12.41

Problem sets are available also in the course homepage.