MASSACHUSETTS INSTITUTE OF TECHNOLOGY
DEPARTMENT OF OCEAN ENGINEERING AND CIVIL AND ENVIRONMENTAL ENGINEERING
13.10J/1.573J Introduction to Structural Mechanics
Fall 1999
Problem Set 10

Assigned : November 16, 1999
Due : November 23, 1999

1. The Part II problems in Problem Set 9.

2. Two problems from Chapter 17 of the course textbook.

   (a) 17.2

   (b) 17.14

3. Given the bending rigidity EI of a column of length L and the spring constant k as in Figure 1, derive an analytical formula for determining the critical buckling loads of the column-spring system and show that it satisfies the following relation:

$$k\sqrt{\frac{P}{EI}}L\cos\left(\sqrt{\frac{P}{EI}}L\right) - k\sin\left(\sqrt{\frac{P}{EI}}L\right) + P\sqrt{\frac{P}{EI}} = 0 \qquad (1)$$

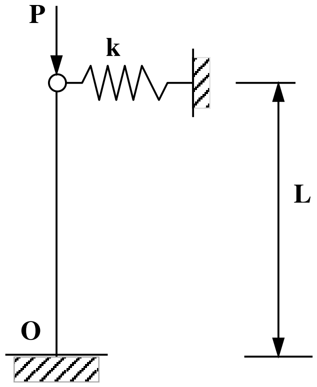

Figure 1: Buckling Problem

Problem sets are available also in the course homepage.