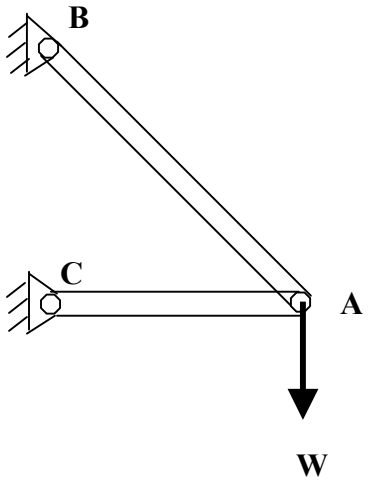
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Department of Mechanical Engineering

2.001 - Mechanics of Materials I
Spring, 2003

Problem Set 2

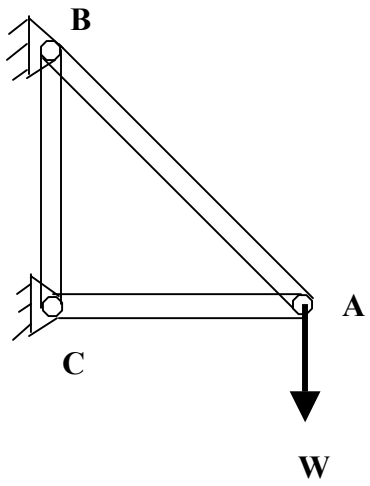
(Due in one week of its assigned date)

Problem 1 : Recall the problem solved in the class, as shown in the figure below. You have seen the solution of this problem. Now solve this same problem again, but this time, take the equilibrium of the *pin* at joint A into account. In other words, assume the load is applied to the pin, and assume internal forces from the pin to the diagonal and the horizontal members. Assume that the two members don't contact each other directly, and all forces are transmitted through the pin. The distance between B and C is *h*, and that between C and A is *d*.



The force W causes loading in the members (as you have just derived.) The next question for you is what dimensions (*d* and *h*) would minimize these loads?

Problem 2 : Consider the structure shown in the figure below, which is very similar to the structure in Problem 1, except that this one has an extra member. Is this structure statically determinate or indeterminate? Verify your answer with calculations.



Problem 2 : From Crandall, Dahl and Lardner, 2.1

Problem 3 : From Crandall, Dahl and Lardner, 3.5

Problem 4 : From Crandall, Dahl and Lardner, 3.10

Problem 5 : From Crandall, Dahl and Lardner, 3.13

Problem 6 : From Crandall, Dahl and Lardner, 3.14

Problem 7 : From Crandall, Dahl and Lardner, 2.6

Problem 8 : From Crandall, Dahl and Lardner, 2.9

There is **extra credit** for problems 7 and 8, but they are **not mandatory**. These two problems are less complicated then they seem. In order to solve these two problems, you will need to read the text book and understand stress, strain and modulus of elasticity.