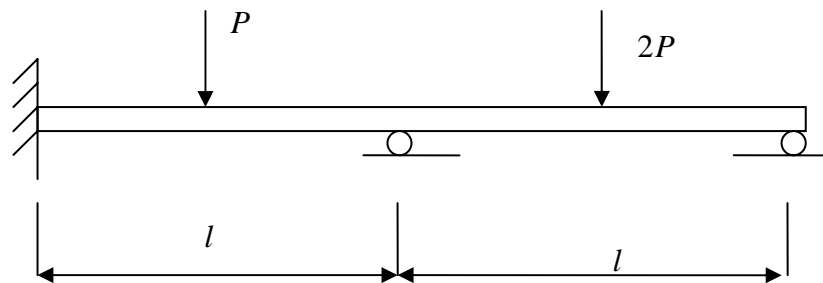2007 2nd semester Concrete plasticity

Concrete Plasticity Homework #1 (Due 9/17)

Use pencil and rulers

1) Find the ultimate load of the following beam by lower bound and upper bound approaches, respectively. The concentrated loads are applied at the center of each span and the beam capacity is Mp.

2) Derive Mohr circle equation using the equilibrium condition. Refer to a textbook.
3) Explain the following terms (each answer only require a half A4)
   - failure criteria
   - generalized forces
   - normality rules
   - uniqueness theorem
   - safe and unsafe
   - tensor
   - interaction curves
   - strut-and-tie models
   - uniaxial stress state
   - plane stress
   - hydrostatic stress state

Concrete Plasticity Homework #2 (Due 9/24)

1) For Mohr Coulomb Material we have only two failure modes such as sliding and separation. To express the failure criteria we need two parameters. One parameter is friction angle and the other is cohesion. In a simple way this is an expression for a line in s-t coordinate system. Now we are going to express this expression in terms of principal stresses. We convert the failure criteria from s-t coordinate system to s1-s2 system.