Name:

Sample Exam 3a

- Design a beam to support a maximum distributed load of 150 kN/m. The beam should be 6 m long and 30 cm deep. Compare three different beam designs to support this load and evaluate which one is the best to support transverse shear loading (you should ignore all other stresses for this portion). At least one of your beam designs should be "built up" (two or more sections joined together).
- For one of your three beams, find the maximum shear stress at the interface between two sections (this applies to a built-up beam).
- Assume that there is an additional normal force of 100 kN. Find the total state of stress from all sources at the point of maximum shear stress you found above.
    1. Draw Mohr's circle for the state of stress.
    2. Using your circle, *estimate* the principal stresses and maximum shear stress at this point.