

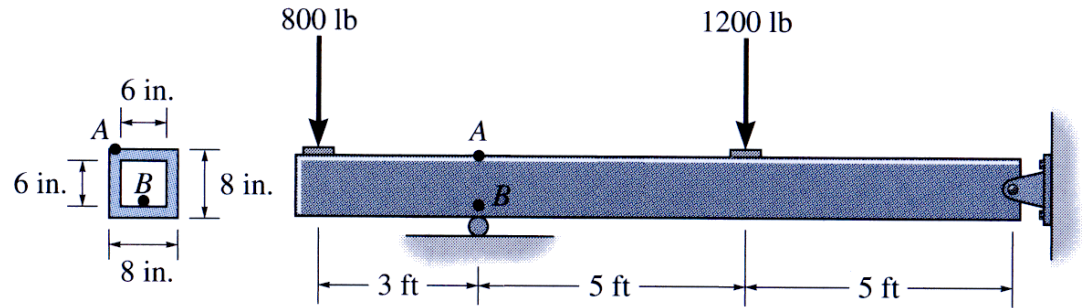
BE 110 - Mechanics of Materials - Winter 2004

Exam 4 – Combined Loading and Beam Deflection

Name:

Section: D

1. Determine the principal stresses and maximum shear stress in the box beam at point B . (To save time, you do not have to sketch the stress states – just determine these three numeric values.)

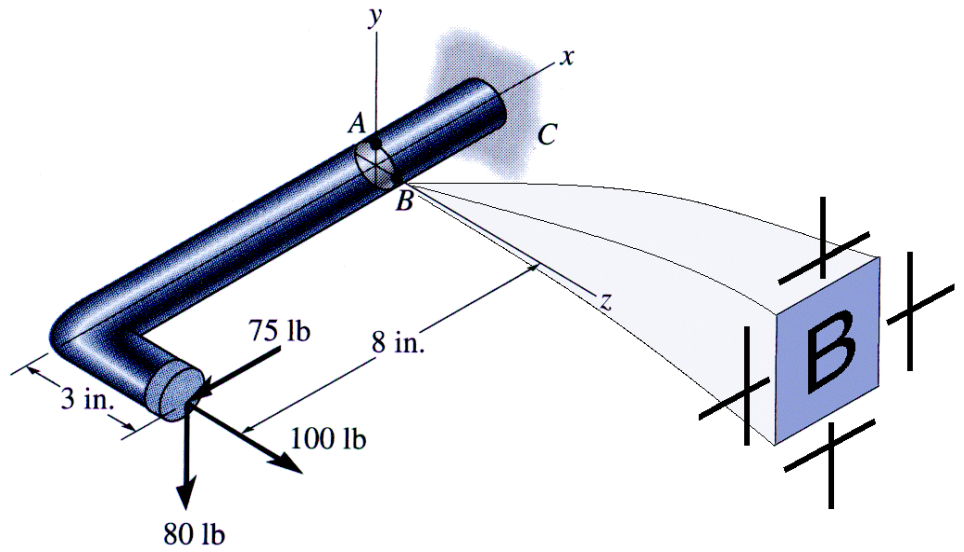


BE 110 - Mechanics of Materials - Winter 2004

Exam 4 – Combined Loading and Beam Deflection

Name:
Section: D

2. Determine the state of stress at point *B* of the 1-in.-diameter rod, and show the results on the provided element.



BE 110 - Mechanics of Materials - Winter 2004

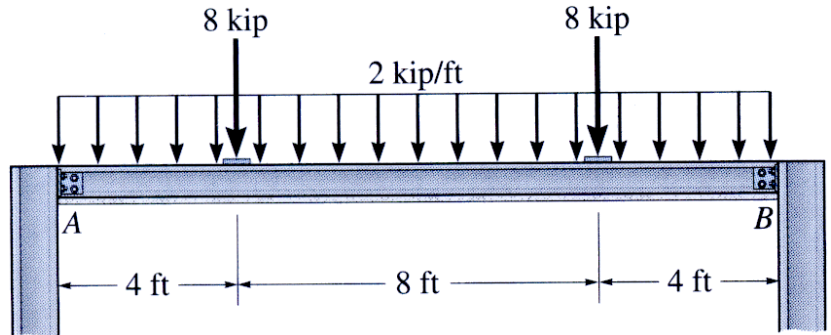
Exam 4 – Combined Loading and Beam Deflection

Name:

Section: D

3. Code restrictions, due to a plaster ceiling, require the maximum deflection not to exceed $1/360$ of the span length (16 ft). Selected the lightest-weight A36 steel wide-flange beam that will satisfy this requirement. Assume A is a pin and B is a roller support. $E = 36 \times 10^6$ psi.

Be careful with your units.



BE 110 - Mechanics of Materials - Winter 2004

Exam 4 – Combined Loading and Beam Deflection

Name:
Section: D

4. Determine the **moment** reactions at supports A and B .

$a = 60$ in.
 $b = 40$ in.
 $L = 100$ in.
 $P = 5000$ lb
 $EI = \text{constant}$

