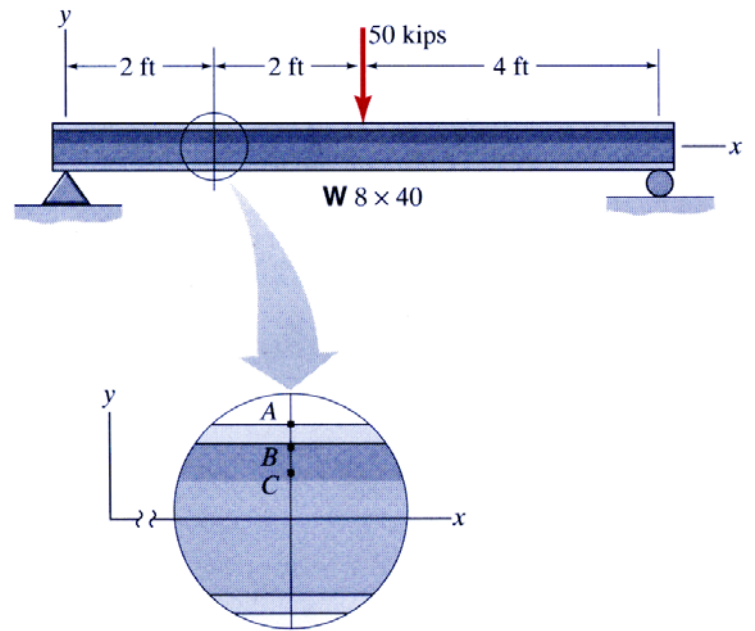1. A W8×40 simply supported steel beam is subjected to a concentrated midspan load of 50 kips. Determine the **principal stresses** at point B just below the top flange.
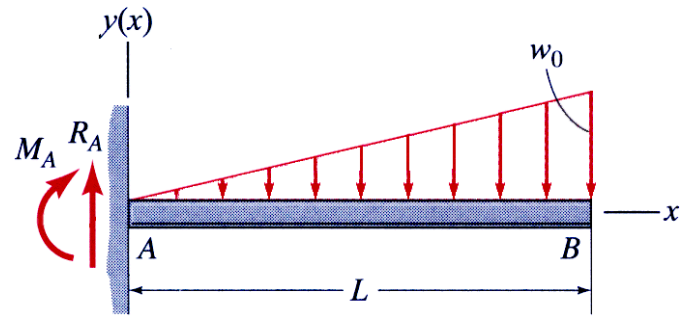
2. A vertical force of 40 lb is applied to a pipe wrench, whose handle is parallel to the z axis. Determine the **principal stresses** at point A on top of the pipe.

Outside diameter = 1.5 in.
Inside diameter = 1.25 in.
Wall thickness = 0.125 in.
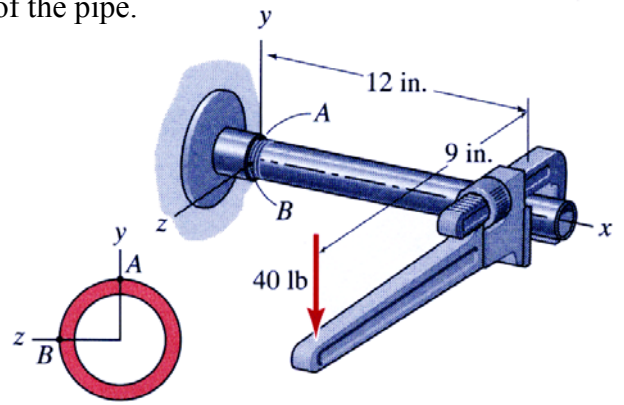
3. Determine the **deflection equation** $y(x)$ for the cantilever beam AB in terms of E, I, w_o, L, and x.

4. Determine the **deflection** y_C at end C of the cantilever beam. Let $E = 30 \times 10^6$ psi and $I = 146$ in⁴.

w = 50 lb/in (up)

M = 28,800 in-lb

A

B

C

24 in

24 in

P = 1200 lb