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 $E$, $I$, $w_0$, $L$, and $x$. 
4. Determine the deflection $y_C$ at end $C$ of the cantilever beam. Let $E = 30 \times 10^6$ psi and $I = 146$ in$^4$. 

\[ w = 50 \text{ lb/in (up)} \]
\[ M = 28,800 \text{ in-lb} \]
\[ P = 1200 \text{ lb} \]