HW #10 Due: 11/21/2000

8-2

$$\sigma_2 = \sigma_{allow} = \frac{pr}{2t}$$

$$15(10^3) = \frac{200\,r}{2(0.5)}$$

$$r = 75.0 \text{ (in)}$$

Since, $\frac{r}{t} = \frac{15}{0.5} = 150 > 10$, so thin wall analysis is valid!

Outer radius

$$r_o = r + t = 75.0 + 0.5 = 75.5 \text{ (in)}$$

8-3

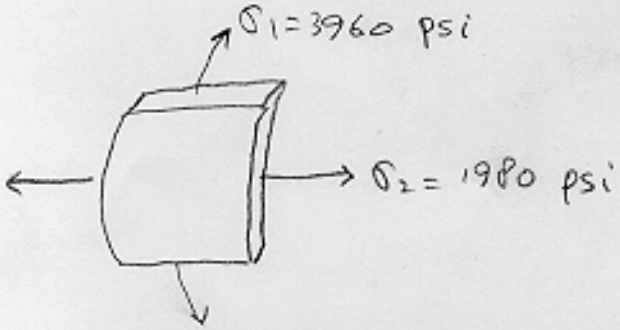
Hoop stress for cylindrical vessels.

$$\frac{r}{t} = \frac{11}{0.25} = 44 > 10$$

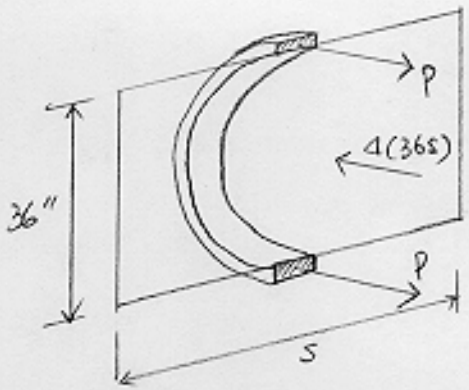
→ thin wall analysis is valid

$$\sigma_1 = \frac{pr}{t} = \frac{90(11)}{0.25} = 3{,}960 \text{ psi}$$

$$\sigma_2 = \frac{pr}{2t} = \frac{90(11)}{2(0.25)} = 1980 \text{ psi}$$



8-9



Equilibrium;

$$\Sigma F_x = 0;\quad 2p - 4(36s) = 0$$

$$p = 72.0(s)$$

Hoop stress;

$$\sigma_1 = \sigma_{allow} = \frac{p}{A}$$

$$12(10^3) = \frac{72.0(s)}{0.2}$$

$$s = 33.3 \text{ (in)}$$