ME 354 Homework #2 Due: January 23h, 2009 before class.

Please answer all questions in the homework format listed on the website.

1) Dowling, Problem 6.22. Draw the three Mohr's circles.

2) Dowling, Problem 6.52. For this problem, you will need to know that

$$\varepsilon_x = \frac{1}{E}\left(\sigma_x - \nu\left(\sigma_y + \sigma_z\right)\right) \tag{1}$$

$$\varepsilon_y = \frac{1}{E}\left(\sigma_y - \nu\left(\sigma_x + \sigma_z\right)\right) \tag{2}$$

$$\gamma_{xy} = \frac{\tau_{xy}}{G} \tag{3}$$

$$G = \frac{E}{2\left(1+\nu\right)} \tag{4}$$

where ε_x and ε_y are the strains, E is the elastic modulus (Table 5.2), σ_x, σ_y, and σ_z are the stresses, ν is Poisson's ratio (Table 5.2), γ_{xy} is the shear strain, and G is the shear modulus. Since the strain gage is mounted on a surface with no force acting on it, $\sigma_z = 0$.