Homework 4 - Stress and Equilibrium

Handed out: Mon., 22-10-2007 **Due to: Thurs., 1-11-2007**

1. The components of the stress tensor at a point of the body in Cartesian coordinates are given by $\sigma_{xx} = 500N/m^2; \sigma_{xy} = 500N/m^2; \sigma_{yy} = 500N/m^2; \sigma_{yz} = -750N/m^2; \sigma_{xz} = 800N/m^2; \sigma_{zz} = -300N/m^2$. Compute the normal and tangential components of the traction vector relative to a surface defined by its normal

$$\underline{\mathrm{n}} = \frac{1}{2}\,\underline{\mathrm{e}}_x + \frac{1}{2}\,\underline{\mathrm{e}}_y + \frac{1}{\sqrt{2}}\,\underline{\mathrm{e}}_z$$

2. Compute the principal stresses and principal directions for the stress tensor of the first question.