ME 354 Mechanics of Materials Laboratory

In-class group project 2

Date _____

Group members _____

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1) For the following three-dimensional stress state, determine the following:

a) Draw a 3-D incremental element (with coordinate axes) with arrows showing the coordinate stress state.
b) 3-D Mohr's circle.
c) All three principal normal stresses.
d) Maximum shear stress.
e) What is unique about this stress state?

$$\begin{bmatrix} \sigma_x = 100 & \tau_{xy} = 0 & \tau_{xz} = 0 \\ \tau_{yx} = 0 & \sigma_y = 0 & \tau_{yz} = 0 \\ \tau_{zx} = 0 & \tau_{zy} = 0 & \sigma_z = 0 \end{bmatrix} MPa$$

2) For the following three-dimensional stress state, determine the following:

a) Draw a 3-D incremental element (with coordinate axes) with arrows showing the coordinate stress state.
b) 3-D Mohr's circle.
c) All three principal normal stresses.
d) Maximum shear stress.
e) What is unique about this stress state?

$$\begin{bmatrix} \sigma_x = 0 & \tau_{xy} = 50 & \tau_{xz} = 0 \\ \tau_{yx} = 50 & \sigma_y = 0 & \tau_{yz} = 0 \\ \tau_{zx} = 0 & \tau_{zy} = 0 & \sigma_z = 0 \end{bmatrix} MPa$$