PROBLEM 1

Draw the three dimensional Mohr’s circle for the following states of stress.







PROBLEM 2

Given the state of stress



1. Determine the stress invariants.
2. Determine the principal stresses.
3. Determine the direction cosines to each of the principal stresses.
4. Determine the transformation matrix from the original state of stress to the principal state of stress and prove that it is the transformation matrix by using it to transform the original state of stress.
5. Determine the state of stress defined by rotating x,y through an angle of 30° counterclockwise about the z axis.
6. Determine the maximum shear stress for this state of stress.
7. Determine the transformation matrix that needs to be used to transform the original state of stress to a state of tress that contains the maximum shear stress on two of the faces and a principal state of stress on the third.