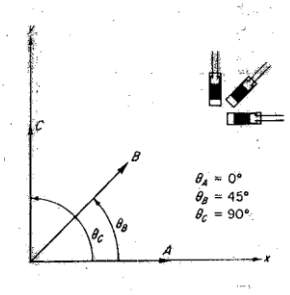
MAE244 – Lab 6 Prelab Quiz

NAME: SECTION #: ID. #

PreLab Quiz: Circular Beam under Combined Loading

1. A structure made of engineering materials is under combined loading (given material Young's modulus and Poisson ratio), you are asked to determine experimentally the stress state at a location of interest on the structure using a strain gage rosette, as shown. Outline step by step, how would you carry out this task using Approach B described in class lecture ? (4 points)



2. Given a two-dimensional strain state (ε_x , ε_y , ε_{xy}), write the Mohr's circle equations in terms of strain. Write the expression for the center of the circle, the radius, the maximum principal strain, the minimum principal strain and the principal angle. All in terms of cartesian strains (2 points)

3. The state of plane stress at a location on a body is shown in the figure. Giving Young's modulus of 70 GPa and Poisson's ratio of 0.3. Determine (1) Cartesian strains, (2) principal strains and (3) principal angle. Also, sketch Mohr's circle for strain (4 points)