**NAME:**

**PROBLEM 1:** The frame structure shown is fixed from translation at D and is fixed from translation in the y-direction at A. A couple loading M is applied to the structure at C.

M

C

B

D

A

**1a.** Considering the bending and normal loads only, determine an expression for the horizontal deflection of point A of this structure when subjected to the load M.

**1b.**  Determine an expression for the rotation of the corner C that results from the frame being loaded by M.

**PROBLEM 2:** The figure below shows a part made of 1/8th in. thick 7075 aluminum. (Su=82ksi and Sy=70ksi). The part is axially loaded.

**2a.** Draw the Goodman diagram that includes both the positive and negative mean stress domains on the paper provided.

1/8 in

1in

3in

**2b.** If the part is load such that the mean stress is two times the stress amplitude, what is the maximum values of the mean and amplitude stress if the part is to be designed for infinite life?

**2c.** If a factor of safety of 2 is required for the design described in 2b, what are the maximum values of the mean and amplitude stresses?