Graded. Additional paper will be provided upon request.

NOTE: Write on the front side of each page. Work on the back of any page will not be read.

I promise or affirm that I will not at any time be involved with cheating, plagiarism, or unauthentic sources of material.

I understand that violation of this Academic Honor Code, which explains my responsibilities as a student at the University of Alabama, will result in punishment as severe as suspension from the university.

If I violate this Academic Honor Code at my enrollment, I understand that violation of this Academic Honor Code, which explains my responsibilities as a student at the University of Alabama, will result in punishment as severe as suspension from the university.

I have read the Academic Honor Code, which explains my responsibilities as a student at the University of Alabama, and I understand that violation of this Academic Honor Code will result in punishment as severe as suspension from the university.

Academic Honor Code

Below is the Academic Honor Code.

All students in attendance at the University of Alabama are expected to honor and to observe the University of Alabama Academic Honor Code (reproduced below from the Undergraduate Catalog).

Students are expected to abide by the University of Alabama Academic Honor Code (reproduced below from the Undergraduate Catalog).

Present a clear and accurate solution procedure.

Significant digits, and

Express your results with the proper units and to the appropriate number of

For full credit, you must:

Exam 1

Mechanics of Materials

3 February 2010

Dr. M. E. Baker

AEM 250-001
(b) With a safety factor of 2.0, determine the largest safe load, P, that can be applied to the board.

(a) Compute the area of the inclined plane that has been indicated, using geometry.

A wooden board has been glued at an angle, and is loaded as shown in the figure. The glue fails.

Problem 1:
The structure below is loaded as indicated. Calculate the average shear stress at pin A, and determine the axial stress in bar (1).

Problem 2:
Problem 3:

An aluminum plate is been determined to have the stress state shown in the figure.

(3) Determine the change in length of the plate in the x-direction after the stresses and heat have been applied.

b) The thermal strains in the x, y, and z directions.

If the plate is also heated from room temperature (20 degrees C) to 300 degrees F, calculate the total change in length of the plate.