Please write out the honor pledge and sign it:

NAME (print): _________________________

MAT 203 – Quiz 1
Due February 14, 2011

Information
Please read and sign the exam conditions first before turning the page:

• No books / notes / calculators / collaborations are allowed.
• The quiz has to be completed in a single time stretch of 45 min. No interruptions!
• Hand-in is on Monday, Feb. 14 in class. Please STAPLE your answer sheets, with this problem sheet as the front page. Write your full name legibly on every sheet.

I have read these conditions and will follow them (initials): __________

Score:

Problem 1: __________ points
Problem 2: __________ points
Problem 3: __________ points
1. Problem (12 points)
Consider the points \( A = (1, 2, 0), B = (-1, 0, 1), C = (0, 2, -3), \) and \( D = (4, 0, -1) \).

i) Find an equation of the line \( L_1 \) passing through \( A \) and \( B \).

ii) Find an equation of the line \( L_2 \) passing through \( C \) and \( D \).

iii) Compute the distance between \( L_1 \) and \( L_2 \).

iv) Find an equation of a plane \( E \) containing \( L_1 \) and parallel to \( L_2 \).

2. Problem (6 points)
Let \( A = \begin{bmatrix} 2 & 0 & -1 \\ 3 & 5 & 3 \end{bmatrix} \) and \( B = \begin{bmatrix} 7 & 2 \\ 4 & 2 \\ 8 & 1 \end{bmatrix} \). Compute \( AB \) and \( \text{det}(AB) \).

3. Problem (6 points)

i) Let
\[ f(x, y) = \frac{e^{xy^2} - 1 - 2x^2 - 2y^2}{x^2 + y^2}. \]
Determine if its limit exists at \((0, 0)\), and if so, compute it.

ii) Let
\[ f(x, y, z) = \begin{cases} 
xyz, & \text{if } (x, y, z) \neq (0, 0, 0) \\
0, & \text{if } (x, y, z) = (0, 0, 0)
\end{cases} \]
Determine if \( f(x, y, z) \) is continuous at \((0, 0, 0)\).

(For both questions, you can make use of knowledge in one variable calculus, the reduction from multi-variable calculus to one-variable calculus has to be rigorous.)