TPHS Linear Algebra — SDSU Math 254 Name: _____

Quiz #1 (1.1 - 1.5) _____ Per.: _____

No calculators allowed. 20 pts.

Clearly show *all* work. Simplify and circle your answers.

1) Solve by Gauss-Jordan elimination (4 pts.)

$$x_1 + 2x_2 + x_3 = 3$$
$$3x_1 - x_2 - 3x_3 = -1$$
$$2x_1 + 3x_2 + x_3 = 4$$

2) For the matrices below, find $A+BC$. (3 pts.)

$$A = \begin{bmatrix} 3 & 4 \\ 1 & 2 \end{bmatrix}, \quad B = \begin{bmatrix} 1 & 3 \\ 2 & 1 \end{bmatrix}, \quad C = \begin{bmatrix} -2 & 1 \\ 3 & 2 \end{bmatrix}$$

3) For $A = \begin{bmatrix} 1 & 2 & 1 \\ 3 & -1 & -3 \\ 2 & 3 & 1 \end{bmatrix}$, find

a) tr(A) (2 pts.) b) A^T (2 pts.) c) A^{-1} (5 pts.)

4) Prove that all invertible matrices are row-equivalent. (4 pts.)
(I.e., Given that A and B are both $n \times n$ and invertible, prove that A and B are row equivalent.)

Bonus Prove that if A is a symmetric, nonsingular matrix, then A^{-1} is also symmetric. (2 pts.)