Quiz #5 for Math 250:1 & 5

3/9/2011

Name ______________________________ **Section** (please circle one) 1 5

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$$\begin{bmatrix} 3 & -2 & 6 & 4 & a \\ 5 & 3 & 2 & 1 & b \\ 1 & -7 & 10 & 7 & c \\ 12 & 11 & 0 & -1 & d \end{bmatrix} \text{ is (after row ops) } \begin{bmatrix} 1 & 0 & \frac{22}{19} & \frac{14}{19} & \frac{2}{19}b + \frac{3}{19}a \\ 0 & 1 & -\frac{24}{19} & -\frac{17}{19} & \frac{3}{19}b - \frac{5}{19}a \\ 0 & 0 & 0 & 0 & -2a+b+c \\ 0 & 0 & 0 & 0 & a-3b+d \end{bmatrix}.$$

This problem discusses the following system of linear equations:

$$\begin{cases} 3x_1 - 2x_2 + 6x_3 + 4x_4 = a \\ 5x_1 + 3x_2 + 2x_3 + x_4 = b \\ x_1 - 7x_2 + 10x_3 + 7x_4 = c \\ 12x_1 + 11x_2 \qquad - x_4 = d \end{cases}$$

In these problems, you need not supply verification of your answers.

1. (2) Find specific numbers for which this system has <u>*no solution*</u>. $\begin{cases} a = \underline{\qquad\quad} \\ b = \underline{\qquad\quad} \\ c = \underline{\qquad\quad} \\ d = \underline{\qquad\quad} \end{cases}.$

2. (3) Consider the collection of all possible $\begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix}$ which are solutions for the associated <u>homogeneous</u> system. Write a <u>generating set</u> of <u>linearly independent</u> vectors for this span.

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This problem discusses the following system of linear equations:

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3. (2) Find specific numbers (*not all 0!*) for which this system has a solution, and display one specific solution.

$$\text{If } \begin{cases} a = \_\_\_\_\_\_ \\ b = \_\_\_\_\_\_ \\ c = \_\_\_\_\_\_ \\ d = \_\_\_\_\_\_ \end{cases} \text{ then one solution is } \begin{cases} x_1 = \_\_\_\_\_\_ \\ x_2 = \_\_\_\_\_\_ \\ x_3 = \_\_\_\_\_\_ \\ x_4 = \_\_\_\_\_\_ \end{cases}.$$

4. (3) Consider the collection of all possible $\begin{bmatrix} a \\ b \\ c \\ d \end{bmatrix}$ for which this system has a solution.

Write a <u>generating set</u> of <u>linearly independent</u> vectors for this span.