

# Math 4133 - Linear Algebra

Quiz #3 - 2013.02.23

Solutions

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1. Determine which of the following matrices are in *rref* form.

$$(a) \begin{bmatrix} 1 & 0 & 0 & 0 & 2 & 5 \\ 0 & 1 & 0 & 0 & 3 & 6 \\ 0 & 0 & 0 & 1 & -1 & -4 \end{bmatrix}$$

$$(b) \begin{bmatrix} 1 & 0 & 2 & 0 \\ 0 & 1 & 0 & -3 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

$$(c) \begin{bmatrix} 1 & 0 & 0 & 3 \\ 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & -2 \end{bmatrix}$$

$$(d) \begin{bmatrix} 1 & 2 & 0 & 0 & 0 & 5 \\ 0 & 0 & 1 & 2 & 0 & 1 \\ 0 & 0 & 0 & 0 & 2 & -2 \end{bmatrix}$$

The matrices corresponding to (a) and (b) are in *rref* form.

2. Write the solutions corresponding to the following *rref* matrices:

$$(a) \begin{bmatrix} 1 & 0 & 0 & 3 \\ 0 & 1 & 2 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

$$(b) \begin{bmatrix} 1 & 0 & 2 & 0 \\ 0 & 1 & 0 & -3 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

The solution corresponding to the matrix in (a) would be  $\{x_1 = 3, x_2 = -2x_3\}$ . The solution corresponding to (b) looks like:  $\{x_1 = -2x_3, x_2 = -3, 0 = 1\}$  and is thus inconsistent.