Name: ______________
Math 40, Section _____
HW03 - Linear Systems, Span, Linear Independence, Matrix Operations
February 2, 2017

Section 2.2 Numbers: 14 , 18, 20, 22, 23*, 30 42
Section 2.3 Numbers: 8 , 16, 28, 42
Chapter 2 Review Numbers: 1f, 1h, 1j
3.1 Numbers: 8, 16, 18

2.2.14 *Use elementary row operations to reduce the given matrix to (a) row echelon form and (b) reduced row echlon form*

$$[M] = \begin{bmatrix} -2 & -4 & 7 \\ -3 & -6 & 10 \\ 1 & 2 & -3 \end{bmatrix}$$

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2.2.18 *Show that the given matricies are row equivalent and find a sequence of elementary row operations that will convert A into B*

$$A = \begin{bmatrix} 2 & 0 & -1 \\ 1 & 1 & 0 \\ -1 & 1 & 1 \end{bmatrix} B = \begin{bmatrix} 3 & 1 & -1 \\ 3 & 5 & 1 \\ 2 & 2 & 0 \end{bmatrix}$$

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2.2.20 *What is the net effect of performing the following sequence of elementary row operations on a matrix (with at least two rows)?*

$$R_1 + R_2, R_1 - R_2, R_2 + R_1, -R_1$$

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2.2.22 *Consider the matrix* $A = \begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix}$ *Show that any of the three types of eleemntary row operations can be used to creat a leading 1 at the top of the first column. Which do you prefer and why?*

$\blacksquare$

2.2.23 *What is the rank of each of the matricies in Exercises 2, 4, 6, and 8*

$$2. \begin{bmatrix} 7 & 0 & 1 & 0 \\ 0 & 1 & -1 & 4 \\ 0 & 0 & 0 & 0 \end{bmatrix} \quad 4. \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$6. \begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix} \quad 8. \begin{bmatrix} 2 & 1 & 3 & 5 \\ 0 & 0 & 1 & -1 \\ 0 & 0 & 0 & 3 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

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2.2.30 *Use either Gaussian or Gauss-Jordan elimination to solve the system*

$$\begin{aligned} -x_1 + 3x_2 - 2x_3 + 4x_4 &= 0 \\ 2x_1 - 6x_2 + x_3 - 2x_4 &= -3 \\ x_1 + 3x_2 + 4x_3 - 8x_4 &= 2 \end{aligned}$$

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2.2.42 *Determine what values of k have, for the following system, (a) no solution, (b) a unique solution, and (c) infinitely many solutions*

$$x - 2y + 3z = 2$$

$$\begin{aligned} x + \ \ y + \ \ z &= k \\ 2x - \ \ y + 4z &= k^2 \end{aligned}$$

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2.3.8 *Determine if the vector **b** is in the span of the columns of the matrix A;*

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 5 & 6 & 7 \\ 9 & 10 & 11 \end{bmatrix} \qquad \mathbf{b} = \begin{bmatrix} 4 \\ 8 \\ 12 \end{bmatrix}$$

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2.3.16

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2.3.28

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2.3.42

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Ch 2.1f

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Ch 2.1h

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Ch 2.1j

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3.1.8

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3.1.16

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3.1.18

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