

**MATH221**

quiz #1, 09/23/14

Total 100

Show all work legibly.

Name: \_\_\_\_\_

1. (20) Solve the system

$$\begin{array}{rcl} 2x_1 & -4x_3 & = 0 \\ & x_2 + 3x_3 & = 2 \\ x_1 + 5x_2 + 8x_3 & = & 0 \end{array}$$

$x_1 =$

$x_2 =$

$x_3 =$

2. (20) Determine values of  $h$  for which the system

$$2x_1 - 6x_2 = h, \quad -4x_1 + 12x_2 = 2$$

has no solutions.

$$h \neq -1$$

3. (20) Let

$$A = \begin{bmatrix} 2 & 0 & 6 \\ -1 & 8 & 5 \\ 1 & -2 & 1 \end{bmatrix},$$

and let  $W$  be the set of all linear combinations of the columns of  $A$ . True or False? The last column of  $A$  is in  $W$ .

Mark one and explain.

- True       False

4. (20) True or False? If  $A$  is  $5 \times 3$  matrix,  $\mathbf{y} = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$ ,  $\mathbf{b} = \begin{bmatrix} 0 \\ 5 \\ 6 \end{bmatrix}$ , and  $A\mathbf{y} = \mathbf{b}$ , then the equation

$$A\mathbf{x} = -2\mathbf{b} = \begin{bmatrix} 0 \\ -10 \\ -12 \end{bmatrix} \text{ is consistent.}$$

Mark one and explain.

True,  $\mathbf{x} =$

False

5. (20) True or False? The vectors

$$\mathbf{v}_1 = \begin{bmatrix} 2 \\ -5 \\ -3 \\ 1 \end{bmatrix}, \mathbf{v}_2 = \begin{bmatrix} 3 \\ 1 \\ -1 \\ 0 \end{bmatrix}, \mathbf{v}_3 = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$$

are linearly dependent.

Mark one and explain.

- True       False

6. (20) True or False? If vectors  $\{\mathbf{v}_1, \mathbf{v}_2, \mathbf{v}_3, \mathbf{v}_4\} \subset \mathbf{R}^5$  are linearly dependent, then the vectors  $\{\mathbf{v}_1, \mathbf{v}_2, \mathbf{v}_3, \mathbf{v}_4, \mathbf{0}\}$  are also linearly dependent.

Mark one and explain.

- True       False