MATH 332
Quiz I
September 3, 1993

Name _____

Time OK allowed 21 min
Started to leave @ 13
Talked at 14-16
then 20+
need = 20

24 1. Write the augmented matrix for the following system of linear equations:

$$2x_1 + 8x_3 + x_5 = 3$$
$$-x_2 + x_3 + 2x_5 = 9$$
$$10x_1 + x_4 = 0$$

$$\left[\begin{array}{ccccc|c} 2 & 8 & 1 & & & 3 \\ 0 & - & & & & \end{array}\right] \qquad \left[\begin{array}{ccccc|c} 2 & 0 & 8 & 0 & 1 & 3 \\ 0 & -1 & 1 & 0 & 2 & 9 \\ 10 & 0 & 0 & 1 & 0 & 0 \end{array}\right]$$

all but 2

16 2. How many solutions are there for the system of equations associated with each of the following augmented matices? [x = a nonzero number.]

14/19

a. $\left[\begin{array}{ccc|c} x & x & x & x \\ 0 & x & x & x \\ 0 & 0 & x & x \end{array}\right]$ 1

b. $\left[\begin{array}{ccc|c} x & x & x & x \\ 0 & 0 & x & x \\ 0 & 0 & 0 & x \end{array}\right]$ $\emptyset$

7 3. Find all solutions (if any) for the system with augmented matrix:

6
3 clear
3 3 params

$$\left[\begin{array}{ccccc|c} 1 & 2 & 3 & 0 & -2 & 3 \\ 0 & 2 & 0 & 2 & 3 & -2 \\ 0 & 0 & 0 & 1 & -2 & 0 \end{array}\right]$$

$x_3 = t$

$x_4 - 2t = 0 \quad x_4 = 2t$

~~$x_1 = -1 + 16t - 3s$~~

$x_1 + 9t - 3s$

$x_2 + 2(2t) + 3t = -2$

$2x_2 + 4t + 3t = -2$

$2x_2 = 2 - 7t \quad x_2 = -1 - \frac{7}{2}t$

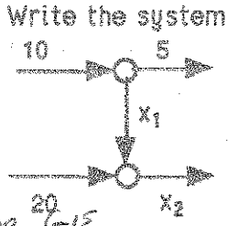
see other sheet

$x_3 = s$

$x_1 + 2(-1 - \frac{7}{2}t) + 3s - 2t = 3$

$x_1 + \cancel{2} - \cancel{7}t + 3s - 2t = 3$

3 4. Write the system of equations for this simple network.



$10 = 5 + x_1 \qquad x_1 = 5$

$20 + x_1 = x_2 \qquad x_1 - x_2 = -20$

10 5. Find all solutions (if any) for the following system of equations:

$$x_1 + 2x_2 + x_4 = 5$$
$$-2x_1 - 2x_2 - 3x_3 = -27$$
$$3x_1 - 2x_2 + 17x_3 - 8x_4 = 118$$
$$4x_2 - 6x_3 + 5x_4 = -34$$

more gross

$$\left[\begin{array}{cccc|c} 1 & 2 & 0 & 1 & 5 \\ -2 & -2 & -3 & 0 & -27 \\ 3 & -2 & 17 & -8 & 118 \\ 0 & 4 & -6 & 5 & -34 \end{array}\right] \xrightarrow[\substack{③+2① \\ ④-3① \\ ④-4②}]{} \left[\begin{array}{cccc|c} 1 & 2 & 0 & 1 & 5 \\ 0 & 2 & -3 & 2 & -17 \\ 0 & -8 & 17 & -11 & 103 \\ 0 & \cancel{-14} & \cancel{5} & \cancel{-4} & \cancel{-9} \\ & 4 & -6 & 5 & -34 \end{array}\right] \xrightarrow[④+7③]{③+4②} \left[\begin{array}{cccc|c} 1 & 2 & 0 & 1 & 5 \\ 0 & 2 & -3 & 2 & -17 \\ 0 & 0 & 5 & -3 & 52 \\ 0 & 0 & -16 & 10 & \end{array}\right]$$

$$\xrightarrow[④-2②]{③+4②} \left[\begin{array}{cccc|c} 1 & 2 & 0 & 1 & 5 \\ 0 & 2 & -3 & 2 & -17 \\ 0 & 0 & 5 & -3 & 35 \\ 0 & 0 & 0 & 1 & 0 \end{array}\right]$$

$$\begin{array}{r} 103 \\ 68 \\ \hline 35 \end{array}$$

5 all
3 got right matrix, but $\emptyset$
7 arith

$x_4 = 0 \qquad 5x_3 = 35 \qquad 2x_2 - 21 = -17$

$x_3 = 7 \qquad 2x_2 = 4$

$x_2 = 2$

$x_1 + 4 + 0 = 5 \qquad x_1 = 1$

$(1, 2, 7, 0)$