

## Math 166 Quiz 1

2/1/2007 Name: \_\_\_\_\_ UIN: \_\_\_\_\_

Show all work for full credit.

- (1) (5 points) (P92, #35) Solve the system of linear equations using the Gauss-Jordan elimination method

$$\begin{aligned}x - 2y &= 8 \\3x + 4y &= 4\end{aligned}$$

*Solution.*

$$\left[ \begin{array}{cc|c} 1 & -2 & 8 \\ 3 & -4 & 4 \end{array} \right] \xrightarrow{R_2 - 3R_1} \left[ \begin{array}{cc|c} 1 & -2 & 8 \\ 0 & 10 & -20 \end{array} \right] \xrightarrow{R_2/10} \left[ \begin{array}{cc|c} 1 & -2 & 8 \\ 0 & 1 & -2 \end{array} \right] \xrightarrow{R_1 + 2R_2} \left[ \begin{array}{cc|c} 1 & 0 & 4 \\ 0 & 1 & -2 \end{array} \right]$$

So the solution is  $(4, -2)$

□

- (2) (5 points) (P115, #23) Solve for  $x, y, z, u$

$$\begin{bmatrix} 1 & x \\ 2y & -3 \end{bmatrix} - 4 \begin{bmatrix} 2 & -2 \\ 0 & 3 \end{bmatrix} = \begin{bmatrix} 3z & 10 \\ 4 & -u \end{bmatrix}$$

*Solution.*

$$\begin{bmatrix} 1 & x \\ 2y & -3 \end{bmatrix} - 4 \begin{bmatrix} 2 & -2 \\ 0 & 3 \end{bmatrix} = \begin{bmatrix} -7 & x+8 \\ 2y & -15 \end{bmatrix} = \begin{bmatrix} 3z & 10 \\ 4 & -u \end{bmatrix}$$

So

$$\begin{aligned}-7 &= 3z \\x + 8 &= 10 \\2y &= 4 \\-15 &= -u\end{aligned}$$

Therefore

$$x = 2, y = 2, z = -7/3, u = 15$$

□