MAT 114 – 001
Review for Test Two
Show all work.

1a. Write the initial tableau for the following minimum problem. You need not solve the problem.

Minimize $c = 30x + 40y + 50z$

subject to the following structural constraints and nonnegativity.

$$\begin{array}{rcl} 10x + 14y + 5z & \geq & 220 \\ 5x + 3y + 9z & \geq & 340 \end{array}$$

1b. Determine the first pivot. You do not need to do the pivot – just determine the row and column of the first pivot.

2a. Write the initial tableau for the following maximum problem. You need not solve the problem.

Maximize $p = 14x + 24y + 26z$

subject to the following structural constraints and nonnegativity.

$$\begin{array}{rcl} 7x + 12y + 12z & \leq & 312 \\ 13x + 20y + 12z & \geq & 384 \\ 5x + 4y + 12z & \geq & 192 \end{array}$$

2b. Determine the first pivot. You do not need to do the pivot – just determine the row and the column of the first pivot.

3. The following is an initial tableau.

	x	y	z	s	t	u	p	constants
s	6	1	5	1	0	0	0	68
t	4	3	1	0	–1	0	0	32
u	2	4	3	0	0	–1	0	36
p	–8	–2	–6	0	0	0	1	0

3a. Is this tableau in phase I or phase II?

3b. Determine the pivot.

4. The following is an initial tableau.

	x	y	z	s	t	u	p	constants
s	5	4	3	1	0	0	0	8
t	2	7	1	0	1	0	0	15
u	6	8	5	0	0	1	0	24
p	–8	–1	0–4	0	0	0	1	0

4a. Is this tableau in phase I or phase II?

4b. Determine the pivot.

5. The following tableau is neither an initial tableau nor a final tableau.

	x	y	s	t	u	v	p	constants
s	0	−1	1	0	0	−1	0	10
t	0	2	0	1	0	−1	0	35
u	0	1	0	0	−1	−2	0	1 0
x	1	0	0	0	0	1	0	2 5
p	0	−1	0	0	0	2	1	50

5a. Is this tableau in phase I or phase II?

5b. Determine the pivot.

5c. Determine the values of x, y, s, t, u, v, and p at this stage.

6. Evaluate $3\begin{bmatrix} 1 & -2 \\ 2 & 3 \end{bmatrix} + 4\begin{bmatrix} 0 & 2 \\ -3 & -1 \end{bmatrix}$.

7. Compute the product $\begin{bmatrix} 1 & 1 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 1 \end{bmatrix}\begin{bmatrix} 2 & -6 & 3 \\ 4 & 2 & 9 \\ 8 & -7 & 2 \end{bmatrix}$.

8. Compute the product $\begin{bmatrix} 2 & -3 & 1 \\ 4 & 0 & -6 \end{bmatrix}\begin{bmatrix} -1 & 3 & 2 & 4 \\ 4 & 0 & 5 & 1 \\ 1 & -2 & -7 & 0 \end{bmatrix}$.

9. Translate the given system of linear equations into matrix form.

$$\begin{aligned} x \quad &+2y \quad -z \quad &= \ 5 \\ -x \quad & \qquad +3z \quad &= \ 6. \\ 2x \quad &-y \qquad \quad &= \ 7 \end{aligned}$$

10. Find the inverse of $\begin{bmatrix} 1 & 1 & -2 \\ 1 & 2 & -1 \\ -1 & 1 & 3 \end{bmatrix}$.

11. $\begin{bmatrix} -1 & 2 & 1 \\ -5 & 8 & 2 \\ 7 & -11 & -3 \end{bmatrix}$ is the inverse of the coefficient matrix of the following system of linear equations.

$$\begin{aligned} 2x &+5y &+4z &= 2 \\ x &+4y &+3z &= -1 \\ x &-3y &-2z &= 3 \end{aligned}$$

Translate the system of linear equations into matrix form and solve the system using the inverse of the coefficient matrix.