Name: ______________________________

Section: ______________________________

1. Determine whether or not the vectors $\mathbf{v}_1, \mathbf{v}_2, \mathbf{v}_3, \mathbf{v}_4$ given below are linearly independent. Use row reduction.

$$\begin{aligned}\mathbf{v}_1 &= (1, 0, 1, 0)\\ \mathbf{v}_2 &= (1, -2, 1, 2)\\ \mathbf{v}_3 &= (0, 1, 2, 1)\\ \mathbf{v}_4 &= (2, 1, 9, 5)\end{aligned}$$

2. For which values of a, b, and c does the following system of equations have a solution? Use row reduction. (Hint: You should find an equation that a, b, and c need to satisfy for the system to be consistent.)

$$\begin{cases} x + y = a \\ 2x - 3y = b \\ 6x - 4y = c \end{cases}$$

3. True/False: Circle the appropriate choice for each question. Circle True only if the statement is always true, and false if the statement is at least sometimes false.

True	False	If a matrix has more rows than columns, then $A\mathbf{x} = \mathbf{b}$ has a solution for all $\mathbf{b}$.
True	False	If two vectors are linearly independent, then one is a multiple of the other.