

Math 220
Spring 2024
Assessment 1
Dusty Wilson

Name: _____

*Life stands before me like an eternal spring
with new and brilliant clothes.*

Carl Friedrich Gauss (1777-1855)
German mathematician

No work = no credit

1. Warm-ups

(a) (1 point) $-2^2 =$

(b) (1 point) Matrix with 2 pivots:

(c) (1 point) Matrix with 2 free variables:

2. (1 point) Gauss wrote the quote (above) when he got engaged to be married. What area do you see as an eternal spring? Answer using complete English sentences.

3. (4 points) Solve the following system using the methods of this class.

$$2x_1 + 4x_2 = -4$$

$$5x_1 + 7x_2 = 11$$

4. (2 points) What do we call a linear system that has no solutions AND give an example of such a system.

5. (2 points) True or False: The pivot positions in a matrix depend on whether row interchanges (swaps) are used in the row reduction process.

Justify your answer.

6. (6 points) Solve the system with the given augmented matrix and write the solution in vector form.

Circle the pivot positions in the original AND final matrix AND list the pivot columns.

$$\left[\begin{array}{ccc|c} 5 & 7 & 9 & 1 \\ 3 & 5 & 7 & 9 \\ 1 & 3 & 5 & 7 \end{array} \right]$$

7. (4 points) Solve the system with the given augmented matrix and write the solution in vector form.

$$\left[\begin{array}{cccc|c} 4 & 0 & 3 & 4 & 27 \\ 1 & 0 & 0 & -2 & 3 \\ 2 & 0 & 1 & 1 & 11 \\ 0 & 0 & 0 & 0 & 0 \end{array} \right]$$