

Name: _____

Score: _____ / 100

Student ID: _____

DO NOT OPEN THE EXAM UNTIL YOU ARE TOLD TO DO SO

	1	2	3	4	5	6	7	8	9	10	Total
✓											27
Score											
Pts. Possible	3	3	3	3	3	3	3	3	3	3	29

INSTRUCTIONS FOR STUDENTS

- Questions are on both sides of the paper. This is an 10 question exam.
- Students have 2 hours and 15 minutes to complete the exam.
- The test will be out of **27 points**. The highest possible score will be **29 points**. You must complete 9 problems for credit (3 points each, 27 points total). If you wish, you can attempt a 10th problem for extra credit. That question will be out of 2 points, for a maximum of 29 possible points.
- In the above table, the row with the ✓ should be marked for the 9 questions you want graded. Mark **EC** for the extra credit problem.
- You may complete parts of problems, as partial credit will be given based on correctness, completeness, and ideas that are leading to the correct solutions.
- **PLEASE SHOW ALL WORK**. Any unjustified claims will receive no credit. Clearly box your final answer.
- No notes, textbooks, phones, calculators, etc. are allowed for the exam.
- The back of the test can be used for scratch work.

GOOD LUCK!

1) Solve the following system of linear equations:

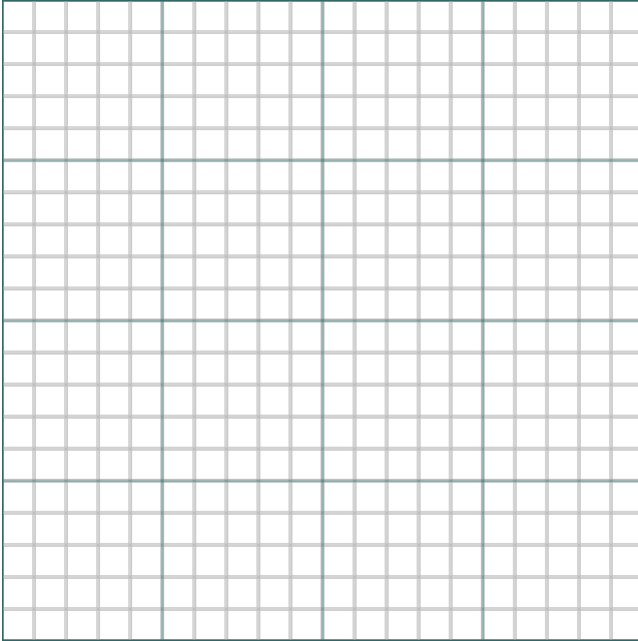
$$\begin{cases} 2x - 3y = -2 \\ 4x + y = 24 \end{cases}$$

2) Solve the following system of linear equations:

$$\begin{cases} 2x + 7y + 11z = 11 \\ x + 2y + 8z = 14 \\ x + 3y + 6z = 8 \end{cases}$$

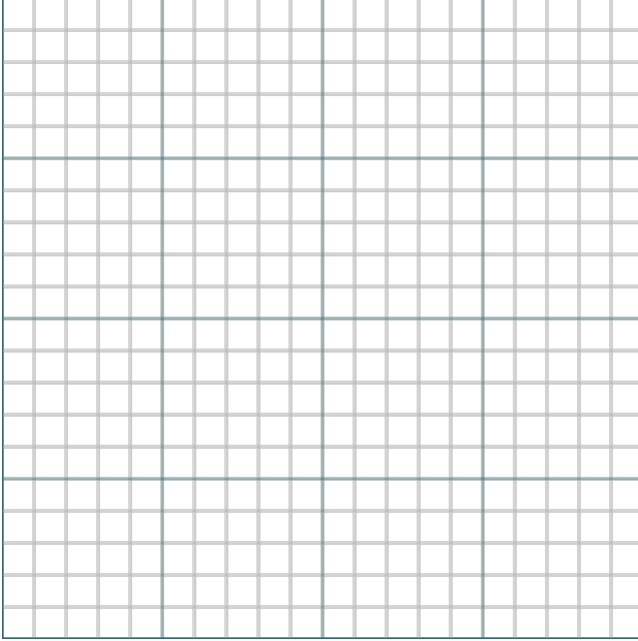
3) Solve the following system of nonlinear equations (*Hint: The graph may be helpful.*):

$$\begin{cases} 2x^2 + y^2 = 24 \\ x^2 - y^2 = -12 \end{cases}$$



4) Graph the solution set of the following system of inequalities:

$$\begin{cases} x^2 + 2y^2 \leq 24 \\ -x^2 + y^2 \leq -12 \end{cases}$$



5) A carpentry shop makes tables and desks. Each week, the shop has to complete at least 9 tables and 13 desks. The shop can make at most 30 tables and desks combined, per week. If the shop sells tables for \$ 120 and desks for \$ 150, how many of each should be made to maximize weekly income for the shop?

6) Solve the following system using Gaussian elimination or Gauss-Jordan elimination.

$$\begin{cases} 3x + 7y + 22z &= 83 \\ x + 3y + 10z &= 37 \\ -2x - 5y - 18z &= -66 \end{cases}$$

7) Solve the following system using Gaussian elimination or Gauss-Jordan elimination.

$$\begin{cases} x - 3y - 17z &= -17 \\ -2x + 7y + 38z &= 40 \end{cases}$$

8) Compute $A \cdot B$ for the following matrices:

$$A = \begin{pmatrix} 1 & 4 \\ 8 & 3 \end{pmatrix} \quad B = \begin{pmatrix} 2 & 5 \\ 1 & 6 \end{pmatrix}$$

9) The matrix A is below. Find its determinant, $\det(A)$.

$$A = \begin{bmatrix} 7 & 2 & 1 \\ 0 & 3 & -1 \\ -3 & 4 & -2 \end{bmatrix}$$

10) The matrix A is below. Find its inverse matrix, A^{-1} .

$$A = \begin{pmatrix} 9 & 7 \\ 5 & 3 \end{pmatrix}$$

THIS PAGE IS LEFT BLANK FOR ANY SCRATCH WORK

END OF TEST