

MAT 114 – 007
Test Two
Show all work.

1. Translate the following system of equations into a matrix equation:

$$\begin{array}{rcl} 2x & -3y & +4z = 6 \\ & 2y & -3z = 7 \\ x & -y & +2z = 4 \end{array}$$

2. Compute the product $\begin{bmatrix} 3 & 0 & -2 & 1 \\ 1 & 2 & 0 & -1 \end{bmatrix} \begin{bmatrix} 2 & 1 & -1 \\ -1 & 2 & 0 \\ 0 & 0 & 1 \\ -1 & -2 & 2 \end{bmatrix}$. Show all work.

3. Find the inverse of $\begin{bmatrix} 1 & -2 & 1 \\ 2 & -3 & -4 \\ 0 & 0 & -1 \end{bmatrix}$. Use Gauss-Jordan reduction. Show all work.

4. Two instructors were comparing their class rolls. Professor A had 28 students, Professor B had 21 students, and 4 students were enrolled in both classes. If there is a joint meeting of the two classes and all the students attend, how many students will be present?

5. A child forms 3-letter “words” using the letters from INVOKED. A letter may be repeated within a word. How many “words” beginning with a vowel are possible?

6. Six children are selected from a group of 22. The 22 children consists of 10 boys and 12 girls. What is the probability that the group of 6 children consists of 3 boys and 3 girls?

7. In how many ways can an investor select 4 mutual funds for an investment portfolio from a recommended list of 8 mutual funds?
8. $P(E) = 0.03$. $P(F) = 0.01$. $P(E \cap F) = 0.001$. Find $P(E \cup F)$.
9. A pair of fair dice, one red and one green, is tossed. What is the probability that the red die shows a 4 given that the sum of the numbers is 7?
10. The following table summarizes the graduating class at a university.

	B.A.	B.S.	B.B.A.	Total
Male	180	60	240	480
Female	159	23	194	376
Total	339	83	434	856

A student is selected at random from the graduating class.

10a. What is the probability that the student is a female, given that the student is receiving a B.S. degree?

10b. What is the probability that the student is a male student who is receiving a B.A. or B.S. degree?

11. A pair of fair dice, one red and one green, is tossed. Let E denote the event that the red die shows 5, and let F denote the event that the sum of the numbers is 6. Are E and F independent events?