

These are some review questions for Exam #3. If you can successfully complete these TYPES of questions, you should be well prepared for the exam.

Section 7.1

1. Use the graphical method to solve $\begin{cases} 2x - 3y = 3 \\ x - y = 0 \end{cases}$

2. Use substitution to solve $\begin{cases} x - y = 8 \\ x - y^2 = 1 \end{cases}$

Section 7.2

3. Use elimination (without matrices) to solve $\begin{cases} 2x + 3y = 17 \\ 5x - 4y = -15 \end{cases}$

Section 7.3

4. Use Gaussian elimination (without matrices) to solve $\begin{cases} 3x + 2y + z = 17 \\ -x + y + z = 4 \\ x - y - z = 3 \end{cases}$

Section 7.4

5. Write the partial fraction decomposition of $\frac{5}{x^2+x-6}$

Section 8.1

6. Solve the following system of equations using Gaussian Elimination AND Gauss-Jordan

Elimination (both with matrices). $\begin{cases} 2x + 3z = 3 \\ 4x - 3y + 7z = 5 \\ 8x - 9y + 15z = 9 \end{cases}$

7. Solve the following system of equations using Gaussian Elimination AND Gauss-Jordan

Elimination (both with matrices). $\begin{cases} x - y + 2z = 4 \\ x + 4y + z = 4 \\ 2x + 2y + 4z = 10 \end{cases}$

Section 8.2

8. Use the following matrices to perform the indicated matrix operations, if possible. Show your work or explain why the operation cannot be performed.

$$A = \begin{bmatrix} 4 & -2 \\ 5 & 0 \\ 6 & 0 \\ 1 & 3 \end{bmatrix} \quad B = \begin{bmatrix} 3 & 5 \\ 1 & 2 \end{bmatrix} \quad C = \begin{bmatrix} 1 & 1 \\ 1 & 1 \\ 4 & 6 \\ 0 & 5 \end{bmatrix}$$

(a) $A + C =$

(b) $2B =$

(c) $AB =$

(d) $BC =$

Section 8.3

9. Consider $A = \begin{bmatrix} 3 & 5 \\ 1 & 2 \end{bmatrix}$

- (a) Find the inverse of A using the formula for a 2×2 matrix.
(b) Find the inverse of A using the augmented matrix procedure.

10. Use the augmented matrix procedure to find the inverse of $A = \begin{bmatrix} 1 & 2 & 2 \\ 3 & 7 & 9 \\ -1 & -4 & -7 \end{bmatrix}$

11. Use inverse matrices to solve $\begin{cases} x + 2y = 4 \\ 3x + 4y = 10 \end{cases}$

Section 8.4

12. Find the determinant of the following matrices:

(a) $B = \begin{bmatrix} -4 & 8 \\ 0 & 3 \end{bmatrix}$

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

Section 9.113. Find the first 5 terms of the sequence $a_n = (-1)^n \left(\frac{n}{n+1}\right)$ 14. Simplify the factorial expression $\frac{(3n+1)!}{(3n)!}$ Section 9.215. Determine whether the sequence $a_n = 100 - 3n$ is arithmetic. Find the first 5 terms.16. Find a formula for a_n for the arithmetic sequence with $a_1 = 15$ and $d = 4$.17. Find the partial sum $\sum_{n=51}^{100} 7n$ Section 9.318. Write an expression for the n th term of the geometric sequence with $a_1 = 5$ and $r = \frac{3}{2}$.19. Find the sum of the finite geometric sequence $\sum_{n=1}^{10} \left(\frac{5}{2}\right)^{n-1}$ 20. Find the sum of the infinite geometric sequence $\sum_{n=0}^{\infty} \left(\frac{1}{10}\right)^n$ Section 9.521. Use the Binomial Theorem to expand and simplify $(x + 2y)^4$