

MATH 124 - Exam 3 Review

1. Solve the system by the elimination method:

$$2x - 7y = 2$$

$$3x + y = -20$$

2. Solve the system by the elimination method:

$$\frac{x}{6} - \frac{y}{2} = \frac{1}{3}$$

$$x + 2y = -3$$

3. Two medium eggs and three cups of ice cream contain 701 milligrams of cholesterol. One medium egg and one cup of ice cream exceed the suggested daily cholesterol intake of 300 milligrams by 25 milligrams. Determine the cholesterol content in each item.

4. Graph inequalities in two variables as in Chapter 5, Section 5.

5. Solve the system using matrices. Use Gaussian elimination with back-substitution or Gauss-Jordan elimination.

$$x - 2y - z = 2$$

$$2x - y + z = 4$$

$$-x + y - 2z = -4$$

6. Solve the system using matrices. Use Gaussian elimination with back-substitution or Gauss-Jordan elimination.

$$3a + b - c = 0$$

$$2a + 3b - 5c = 1$$

$$a - 2b + 3c = -4$$

7. For the following matrices A & B , find a) $A + B$ b) $A - B$ c) $3A + 2B$

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

8. For the following matrices A & B , find a) AB b) BA

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

9. Write the first four terms of the sequence whose general term is:

$$a_n = (-1)^{n+1}(n + 4)$$

10. Write the first four terms of the sequence that uses the recursion formula:

$$a_1 = 5 \quad \text{and} \quad a_n = 3a_{n-1} - 1 \quad \text{for} \quad n \geq 2$$

11. Evaluate the factorial expression: $\frac{20!}{2!18!}$

12. Find the indicated sum:

$$\sum_{i=1}^6 7i$$

13. Find the indicated sum:

$$\sum_{i=1}^5 \frac{(i + 2)!}{i!}$$

14. Write the first six terms of the arithmetic sequence: $a_1 = -8$, $d = 5$

15. Find a_{60} when $a_1 = 8$ and $d = 6$.

16. Write a formula for the general (nth) term of the arithmetic sequence.

Then use the formula to find a_{20} , the 20th term. $2, 7, 12, 17, \dots$

17. Find the sum of the first 80 positive even integers.

18. Write the first five terms of the geometric sequence: $a_1 = 24$ $r = \frac{1}{3}$

19. Use the formula for the general (nth) term of a geometric sequence to find a_{12} when $a_1 = 4, r = -2$

20. Find the sum of the first 11 terms of the geometric sequence:

$$4, -12, 36, -108, \dots$$