MATH 124 - Exam 4 Review
All material covered in class is eligible for exam, this review is not all inclusive.

1. Solve the following system:
   \[x + 3y = -7\]
   \[2x - 9y = 31\]

2. Solve the following system:
   \[\frac{1}{2}x - \frac{1}{3}y = \frac{5}{6}\]
   \[-\frac{3}{2}x + \frac{1}{2}y = -\frac{9}{10}\]

3. The sum of two numbers is 32. One of the numbers is 4 less than 5 times the other. Find the two numbers.

4. If tickets for a show cost $2.00 for adults and $1.50 for children, how many of each kind of ticket were sold if a total of 300 tickets were sold for $525?

5. If Amy has 15 coins totaling $2.70, and the coins are quarters and dimes, how many of each coin does she have?

6. Graph the solution set for: \[y \leq 2x - 1\]

7. Graph the solution set for the system of inequalities
   \[x \geq -3\]
   \[y < 2\]

8. For the matrices below find: \[4A - 3B\]

   \[A = \begin{bmatrix} 2 & -3 \\ -1 & 4 \end{bmatrix} \quad (1)\]

   \[B = \begin{bmatrix} -3 & -1 \\ 4 & -4 \end{bmatrix} \quad (2)\]

9. For the matrices below, find \[AB\] and \[BA\]

   \[A = \begin{bmatrix} -1 & 1 \\ 2 & -3 \end{bmatrix} \quad (3)\]

   \[B = \begin{bmatrix} 4 & 3 \\ -2 & -1 \end{bmatrix} \quad (4)\]
10. Write the first five terms of the sequence with the general term: \( a_n = n^3 + 1 \)

11. Write the first five terms of the sequence with the general term: \( a_n = (-3)^n \)

12. Write the first five terms of the sequence with the general term: \( a_n = 3n! \)

13. Write the first five terms of the sequence defined by the recursion formula: \( a_1 = -3, a_n = -2a_{n-1} + 5, \ n > 1 \)

14. Determine the general term for the sequence: \( 7, 10, 13, 16, \ldots \)

15. Determine the general term for the sequence: \( \frac{1}{4}, \frac{2}{9}, \frac{3}{16}, \frac{4}{25}, \ldots \)

16. Expand and simplify:

\[
\sum_{i=1}^{3} i^i
\]

17. Expand and simplify:

\[
\sum_{i=2}^{5} i^2 - 1
\]

18. If \( a_1 = 7 \) and \( d = -1 \), find \( a_{24} \) and \( S_{24} \)

19. If the third term is 16 and the eighth term is 51, find the first term, the common difference, and then find \( a_{50} \) and \( S_{50} \)

20. Find the sum of the first 50 terms of the sequence, 8, 11, 14, 17, \ldots

21. If \( a_1 = 25 \) and \( r = \frac{1}{5} \), find \( a_6 \)

22. Find \( a_8 \) and \( S_8 \) for 2, 6, 18, 54, ...

23. Find \( a_8 \) and \( S_8 \) for 2, -8, 32, -128, ...

24. Find the sum of the infinite geometric series: \( 4, 2, 1, \frac{1}{2}, \ldots \)

25. Find the sum of the infinite geometric series: \( 6, -4, \frac{8}{3}, -\frac{16}{9}, \ldots \)