Read each question carefully. You must show all work in order to receive full credit. **Circle your final answer**.

1. Solve the system of equations by putting the matrix in reduced row echelon form.

$$3x + 4z = -11$$
$$x - 2y = 5$$
$$4y - z = -10$$

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2. Write sigma notation for the following series.

$$\frac{1}{1 \cdot 2} + \frac{1}{2 \cdot 3} + \frac{1}{3 \cdot 4} + \frac{1}{4 \cdot 5} + \cdots$$

3. Find the 12th term of the arithmetic sequence $2, 6, 10, \ldots$

4. Find the sum of all multiples of 4 that are between 14 and 523.

5. Find the common ratio.

$$75, 15, 3, \frac{3}{5}, \ldots$$

6. Find the 12th term of the geometric sequence $2, 4, 8, 16, \ldots$

7. Find the sum of the geometric series, if it exists. Give an exact answer.

$$-8 + 4 + (-2) + \cdots$$

8. Given a set with 9 elements, how many ways are there to choose 5 of them?

9. Find the 6th term of $(2x - y)^8$.

10. Determine the number of subsets of a set with 14 elements.