Math Expressions for RAG System Testing

1. Solve the following quadratic equation:

$$ax^2 + bx + c = 0$$

Where a, b, and c are constants.

2. Find the derivative of the following function:

$$f(x) = 3x^4 - 5x^3 + 2x - 7$$

3. Evaluate the integral:

$$I = \int_0^1 (x^2 + 2x)\, dx$$

4. Solve the following system of equations:

$$3x + 2y = 5$$

$$4x - y = 6$$

5. Find the determinant of the matrix:

$$A = \begin{pmatrix} 1 & 2 & 3 \\ 0 & 1 & 4 \\ 5 & 6 & 0 \end{pmatrix}$$

6. Simplify the following expression:

$$\frac{5x^2 + 3x - 8}{x^2 + 2x - 3}$$

7. Solve for x in the following logarithmic equation:

$$\log_2(x + 3) = 4$$

8. Evaluate the limit:

$$\lim_{x \to 0} \frac{\sin(x)}{x}$$

9. Solve the following exponential equation:

$$2^x = 16$$

10. Perform the following matrix multiplication:

$$A = \begin{pmatrix} 1 & 3 \\ 2 & 4 \end{pmatrix}$$

$$B = \begin{pmatrix} 5 & 6 \\ 7 & 8 \end{pmatrix}$$

$AB = ?$