Mathematics 101 - Final Examination

Fall Semester 2025

Name: _____

Student ID: _____

Instructions:

- This exam has 5 problems worth 100 points total.

- Show all work for full credit.

- You have 120 minutes to complete this exam.

- No calculators or notes allowed.

Problem	Points	Score
1	20	
2	20	
3	20	
4	20	
5	20	
Total	**100**	

Problem 1. (20 points) Solve the following equation for x:

$$3x^2 - 7x + 2 = 0$$

Problem 2. (20 points) Find the derivative of:

$$f(x) = \frac{\sin(x)}{x^2 + 1}$$

Problem 3. (20 points) Evaluate the integral:

$$\int_0^1 xe^{x^2}dx$$

Problem 4. (20 points) Prove that if a and b are even integers, then $a + b$ is even.

Problem 5. (20 points) Find the limit:

$$\lim_{x \to 0} \frac{\sin(3x)}{2x}$$