There are 7 problems on this exam. There are a total of 100 points possible. You must show all of your work for credit.

No Calculators are allowed on this test.

Problem 1: (15 points) Evaluate the integral: \[ \int_{-9}^{7} \frac{dx}{(x + 8)^2} \]

Problem 2: (15 points) Find the limit: \[ \lim_{x \to 0} \frac{\sin(x) - x}{x^3} \]

Problem 3: (15 points) Evaluate: \[ \int \ln(2x) \, dx \]

Problem 4: (15 points) Evaluate: \[ \int \sec^5(x) \tan^3(x) \, dx \]

Problem 5: (15 points) Evaluate: \[ \int \frac{3x + 4}{(x^2 + 4)(3 - x)} \, dx \]

Problem 6: (15 points) Evaluate: \[ \int \frac{1}{(16 - x^2)^{\frac{3}{2}}} \, dx \]

Problem 7: (10 points) Evaluate: \[ \int \frac{1}{x \sqrt{\ln(x)}} \, dx \]

Extra Credit: (5 points) Find: \[ \lim_{x \to 0} \left( 1 + \frac{2}{x} \right)^x \]