Math 166: Midterm Exam — Part 1 (40 Minutes)
Spring 2015 - Thursday, February 26, 2015

This part of the exam has 5 problems for a total of 40 possible points. Each problem is worth 8 points.

You may NOT use a calculator on this section. You must show all work, but you need not simplify your answers unless instructed to do so. This part of the exam will be collected after 40 minutes.

Question 1: ______

Question 2: ______

Question 3: ______

Question 4: ______

Question 5: ______

40 Total Points: ______
Question 1. Evaluate $\int \sqrt{x} \ln(2x^2) \, dx$.

Question 2. Find the value of $\int_{0}^{\frac{\pi}{2}} \tan^3(3\theta) \sec^4(3\theta) \, d\theta$. 
Question 3. Consider the integral \( \int (Ar^2 + Br + 1)(4r^3 - 6r^2 + 2r - 3)^{7/3} \, dr \). Your goal is to (i) select numerical values of \( A \) and \( B \) to make the integral easy to evaluate, then (ii) evaluate the integral with your chosen values of \( A \) and \( B \).

I choose \( A = \) _____ and \( B = \) _____.

Here is my evaluation of the resulting integral:

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Question 4. Evaluate \( \int \frac{5t - 4}{(t+2)(4t+1)} \, dt \).
Question 5. Find the value of $\int \frac{dx}{(x^2 + 9)^{3/2}}$. 