For more information and answers or partial solutions, see the class homework blog at http://math1201.blogspot.com

Topics for this test:

- Antiderivatives and Indefinite integrals
- Definite Integrals
- The Fundamental Theorem of Calculus
- Integration using substitution
- Integration by parts
- The antiderivative of the natural logarithm function
- Trigonometric integrals of the form $\int \sin^m(x)\cos^n(x)\mathrm{d}x$, where m and n are positive integers.

Instructions: These problems are for you to use to test yourself, **after** you have practiced with the routine homework assignments, to see how ready you are for Test 1. They are not meant as a substitute for regular and diligent practice!

Do the following problems as if you were taking a test: without notes or textbook, and give yourself a time limit as stated at the start of each self-test. At the end of that time, check your answers against the answers posted on the blog. Then review as needed from the relevant sections, before you re-test.

Self-Test 1: allow 50 minutes.

Find the indefinite integral: leave numbers as fractions in lowest terms rather than decimals.

1) $\int (3\cos(x) - 1 + e^x)\,\mathrm{d}x$

2) $\int \left(2e^{-3x}\right)\mathrm{d}x$

3) $\int x^2 \sin(x)\mathrm{d}x$

Find the value of the definite integral: round to the nearest hundredth if necessary.

4) $\int_0^2 xe^x\mathrm{d}x$

5) $\int_1^2 \sin(\pi x)\mathrm{d}x$

6) What is $g'(x)$ if $g(x) = \int_{-1}^{x} \sqrt{t^2+5}\mathrm{d}t$?

7) Find the indefinite integral $\int \sin^3(x)\cos^5(x)\mathrm{d}x$

Self-Test 2: allow 50 minutes.

Find the indefinite integral: leave numbers as fractions in lowest terms rather than decimals.

1) $\int \left(\frac{x^3-5x^2}{x}\right) \mathrm{d}x$

2) $\int e^x \sin(x) \mathrm{d}x$

3) $\int x \sin\left(x^2\right) \mathrm{d}x$

Find the value of the definite integral: round to the nearest hundredth if necessary.

4) $\int_{\pi}^{2\pi} x \cos(x) \mathrm{d}x$

5) $\int_0^3 e^{-x} \mathrm{d}x$

6) What is $g'(x)$ if $g(x) = \int_x^{x^2} \sqrt{t^2+5} \mathrm{d}t$?

7) Find the indefinite integral $\int \sin^2(x) \cos^2(x) \mathrm{d}x$