TEST 2

(MATH 200 (A), Fall 06)

1. Evaluate the following integral: $\int 2\sin 6\theta \cos 2\theta \, d\theta$. (10 pts)

2. Show that: $\int_0^{\pi/4} \tan^4 x \sec^4 x \, dx = \frac{12}{35}$. (10 pts)

3. Using the identity $\cos^2 x - \sin^2 x = \cos 2x$, show that: $\int \frac{1-\tan^2 x}{\sec^2 x} dx = \frac{1}{2}\sin 2x + C$.
(*Hint*: This should take you no more than 4 steps) (10 pts)

4. Evaluate the following integral: $\int \frac{dx}{\sqrt{x^2 - 2x + 5}}$. (10 pts)

5. Evaluate the following integral: $\int \frac{2x^2 - x + 4}{x^3 + 4x} dx$. (20 pts)

(*Hint*: Here you will need to use partial fractions)

6. Evaluate (if possible) the following improper integrals: (30 pts)

(a) $\int_4^\infty e^{-y/2}\, dy$

(b) $\int_0^3 (x-2)^{-4/3}\, dx$

7. Use the Comparison Test to determine whether the integral $\int_1^\infty \frac{2 + e^{-x}}{x} dx$ is convergent or divergent. (10 pts)