MA 126: CALCULUS II
MIDTERM TEST #1, FEBRUARY 9, 2005

Time limit: 105 min.

Your name (print):

Your signature:

1. Find a function f and a number a such that

$$3 + \int_a^x \frac{f(t)}{1 + \sin^2 t} dt = 3e^x$$

for all x.

10 points

2. Differentiate the function g.

$$g(x) = \int_7^{x^2} (e^t + e^{-t})dt.$$

10 points

3. Find $\dfrac{dy}{dx}$ if

$$y = \int_{e^x}^0 \sin^2 t \, dt.$$

10 points

4. Evaluate the indefinite integral

$$\int \cos x \sin(\sin x)dx.$$

10 points

5. Evaluate the definite integral

$$\int_0^{\pi/4} e^{\sin x} \cos x \, dx.$$

10 points

6. Evaluate the definite integral

$$\int_{-2}^{2} x\sqrt{1+x^6}\,dx.$$

10 points

7. Calculate the indefinite integral

$$\int \cos(\ln t)\,dt.$$

10 points

8. Calculate

$$\int_0^1 e^{\sqrt{x}}\,dx.$$

10 points

9. Evaluate

$$\int_{-\pi/2}^{\pi/2} \cos^4 x\, dx.$$

10 points

10. Calculate the indefinite integral

$$\int \frac{x^2}{x^3 - x} dx.$$

10 points