

Here is the beginning of the first exam in a previous semester. I'll give you 10 minutes to try these in class.

**MAT 137 (Calculus II) Prof. Swift**  
**Exam 1, 10:20-11:10, February 8, 2006**  
**Review and Techniques of Integration**

No notes are allowed. No calculators are allowed.

All problems have equal weight.

**The exam will begin and end promptly.**

1. Find the derivatives.

(a)  $f(x) = x^3 + 3x^2 + 5$

(b)  $y = \sin(e^x)$

Simplify your expression for  $g'(x)$  in the next part.

(c)  $g(x) = \frac{x+1}{x-1}$

(d)  $f(x) = \cos(x) \cdot (x^2 + x + 1)$

(e)  $g(x) = \arcsin(x^2)$

(f)  $y = \ln|x^2 - 1|$

2. Compute the integrals.

(a)  $\int (x^2 + x + 1) dx$

(b)  $\int \left( \sin(x) + 2 \cos(x) + \frac{3}{1+x^2} \right) dx$

(c)  $\int x e^{x^2} dx$

(d)  $\int \frac{x^2 - 3x + 2}{x} dx$