

August 30, 2004

Show all work for credit.

1. Find  $dy/dx$  given  $y^5 + x^2y^3 = 1 + ye^{x^2}$

2. If  $f$  is differentiable, write  $\frac{d}{dx}\sqrt{f(x)}$ .

3. Evaluate  $\int \frac{dx}{\cos^2 x}$ , for  $x$  between  $-\pi/2$  and  $\pi/2$ .

4. Evaluate the following limits:

(a)  $\lim_{x \rightarrow 9} \frac{x^2 - 81}{\sqrt{x} - 3}$

(b)  $\lim_{x \rightarrow 0^+} x^{x^2}$