

NAME:_____ SECTION:_____

CALCULUS II (Math 150B): Midterm I, September 17, 2004.

General Instructions

1. You are allowed your cheatsheet (one page, front only).
2. NO Calculators.
3. Please show all your work, unless explicitly instructed not to do so.
4. Unless otherwise stated, you may use the tables in any problem you like on this test.
5. Please ask if you are not sure of anything on the exam.
6. You have 80 minutes.

1. (10 pts) Evaluate the following integrals:

(a) $\int x^2 e^{x^3+4} dx.$

(b) Evaluate $\int t\sqrt{t-3} dt.$

2. (10 pts) Evaluate the following integrals:

(a) Evaluate $\int \frac{1}{(\sqrt{\ln x})^{(x)}} dx.$

(b) Evaluate $\int \sqrt{25+x^2} dx.$

3. Compute $\int_1^5 x^2 g''(x) dx$ where $g(1) = 2$, $g(5) = 0$, $g'(1) = 0$, $g'(5) = 1$ and $\int_1^5 g(x) dx = 27$. [Hint: Integration by parts.]

4. (15 pts) Evaluate $\int \frac{x^7}{\sqrt{x^4-5}} dx.$

5. (15 pts) Evaluate

$$\int_1^{e^\pi} \frac{\cos(\ln x) \sin(\ln x)}{x} dx.$$

6. (20 pts) Let $Q(x) = x^2 - 3x - 10$.

(a) Evaluate $Q(5) =$

(b) Factor $Q(x) = x^2 - 3x - 10 = (x \quad)(x \quad)$.

(c) Evaluate $\int \frac{1}{(x^2-3x-10)(x+2)} dx$.

Notice that $(x^2-3x-10)(x+2) = x^3-3x^2-10x+2x^2-6x-20 = x^3-x^2-16x-20$.

(d) Evaluate $\int \frac{x^4-x^3-16x^2-20x+1}{x^2-3x-10} dx$.

7. Evaluate $\int \frac{1}{4x^2+16x+25} dx$ without using the tables. [Hint: Amongst other things use trig. substitution.]