

Do not write in the boxes immediately below.

Question:	1	2	3	4	5	6	Total
Points:	45	9	7	16	8	15	100
Score:							

## MATH 2250 Exam 4

April 28, 2009

Name: \_\_\_\_\_

1. (45 points) Evaluate each of the following. Do not simplify your answers.

(a)  $\int \left( \frac{\sqrt{x} - x^2}{x^3} \right) dx.$

(b)  $\int \left( \frac{-6}{\sqrt{1-x^2}} + 1 \right) dx.$

(c)  $\int_{-6}^0 |2x + 4| dx$

(d)  $\int_1^3 x^2(x^3 - 4) dx$

2. (9 points) True or False:  $\int \frac{1}{x^2(x+1)} dx = \frac{-1}{x} + \ln(x+1) - \ln(x) + C$ .  
**Justify your answer.**

3. (7 points) Evaluate the sum  $\sum_{k=0}^3 ((-1)^k (k-2)^2 + 2k)$ .

4. (16 points) Suppose that

$$\int_3^{12.5} f(x) dx = 6, \int_6^{12.5} f(x) dx = -2, \text{ and } \int_3^9 f(x) dx = 4.$$

Find  $\int_6^9 (5f(x) - 4x) dx$ .

5. (8 points) Suppose that  $F(x) = \int_{-5}^{x^7} \frac{\sin t}{t^2 + t + 1} dt$ . Find  $F'(x)$ .

6. (15 points) Find  $\lim_{x \rightarrow 0^+} x(\ln x)^2$ . **Show all of your steps.**