MTH 151
Quiz 7
Fall 2011

Show all work in a neat and organized fashion. Clearly indicate your answers.
20 points possible.

1. (6 pts.) Take home problem. Find $\int_4^6 x^2\,dx$ the "long way."

2. (6 pts.) Oil leaked from a tank at a rate of $r(t)$ liters per hour. The rate decraeased as time passed. Values of the rate at three-hour time intervals are shown in the table.

t (hr)	0	3	6	9	12	15
$r(t)$ (L/hr)	10.7	9.6	8.8	8.2	7.7	7.3

(a) Use a Riemann sum with right endpoints and five subintervals to estimate $\int_0^{15} r(t)\,dt$, the total amount of oil leaked out.

(b) Is your estimate greater or less than the true value?

3. (3 pts.) Determine a definite integral that is equal to the given limit. In other words, find $f(x)$, a, and b. (Do not evaluate the limit or the integral.)

$$\int_a^b f(x)\,dx = \lim_{n\to\infty} \sum_{i=1}^{n} \frac{6}{n}\left(10 + \frac{6i}{n}\right)^3$$

4. (2 pts.) Write the expression as a single integral in the form $\int_a^b f(x)\,dx$.

$$\int_3^8 f(x)\,dx + \int_8^{20} f(x)\,dx - \int_{16}^{20} f(x)\,dx$$

5. (3 pts.) Evaluate the integral by interpreting it in terms of area.

$$\int_{-5}^{5} \sqrt{25 - x^2}\,dx$$