Math 151
Quiz 8

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

$$\int_a^b c\,dx = c(b-a) \qquad \int_a^b x\,dx = \frac{b^2}{2} - \frac{a^2}{2} \qquad \int_a^b x^2\,dx = \frac{b^3}{3} - \frac{a^3}{3}$$

1. (3 pts.) Find $\displaystyle\int_2^5 f(t)\,dt$ where $f(t) = \begin{cases} t, & \text{if } t < 3 \\ t^2, & \text{if } t \geq 3 \end{cases}$

2. (3 pts.) A particle is moving with the given data. Find the position function of the particle.

$$v(t) = 3\cos t + 7\sin t, \quad s(0) = 4$$

3. (4 pts.) **Set up** the following problem but **do not solve it**.

("Set up" means write down the function to be maximized and get it as a function of one variable only. Be sure to say or to show in a sketch what your variable represents.)

Find the dimensions of the rectangle of largest area that can be inscribed in an equilateral triangle of side 100 if one side of the rectangle lies on the base of the triangle.