232 FTC Quiz
April 6, 2008   **Name:** _____

You may NOT use your notebook or any other materials.

1. State each of the following. Remember to include hypotheses of theorems and definitions of any notation you use.

    Give the Riemann Sum definition of $\int_{-1}^{2} x^3 \, dx$.
    DO NOT SIMPLIFY OR COMPUTE.

    What does the quantity above measure? Feel free to draw a picture.

    Use the Fundamental Theorem of Calculus to compute this quantity.

2. Fill in the blanks to answer each question below.

    In what sense is the indefinite integral the "opposite" of differentiation (or not)?

    $$\int f'(x) \, dx = \underline{\hspace{3cm}} \qquad \frac{d}{dx} \int f(x) \, dx = \underline{\hspace{3cm}}$$

    In what sense is the definite integral the "opposite" of differentiation (or not)?

    $$\int_{a}^{b} f'(x) \, dx = \underline{\hspace{3cm}} \qquad \frac{d}{dx} \int_{a}^{b} f(x) \, dx = \underline{\hspace{3cm}}$$

    In what sense are area accumulation functions the "opposite" of differentiation (or not)?

    $$\int_{a}^{x} f'(t) \, dt = \underline{\hspace{3cm}} \qquad \frac{d}{dx} \int_{a}^{x} f(t) \, dt = \underline{\hspace{3cm}}$$