**Instructions:** This homework is an individual effort. Answer each question. This is due on **Monday, April 13th**. **Show all work to receive full credit.**

1. Evaluate the following indefinite integrals:

    a. $\displaystyle\int e^x \, dx$

    b. $\displaystyle\int x^7 \, dx$

    c. $\displaystyle\int 5x^4 \, dx$

    d. $\displaystyle\int \frac{1}{2x} \, dx$

    e. $\displaystyle\int 2\pi r \, dr$

    f. $\displaystyle\int (3x^2 + 4x + 5) \, dx$

    g. $\displaystyle\int \frac{3}{\sqrt{x^3}} \, dx$

2. Evaluate the following definite integrals. SHOW ALL WORK

    a. $\displaystyle\int_1^2 (3x^2 + 2x + 1) \, dx$

    b. $\displaystyle\int_{-1}^1 (-x^2) \, dx$

    c. $\displaystyle\int_{-3}^3 x^3 \, dx$

    d. $\displaystyle\int_1^3 \left(\frac{1}{x} + e^x\right) dx$

3. Water is pumped out of a holding tank at a rate of $5 - 5e^{-0.12t}$ liters per minute, where $t$ is the number of minutes since the pump started. Find the amount of water pumped out after 1 hour.