College of the Holy Cross, Spring Semester, 2019
Math 134 Worksheet 4
Due Thursday, February 7

1. Evaluate the following definite integrals.

   (a) $\displaystyle\int_0^3 e^{-x}\,dx$

   (b) $\displaystyle\int_1^4 \sqrt{t}\,dt$

   (c) $\displaystyle\int_1^2 \frac{2x^2+3}{x}\,dx$

   (d) $\displaystyle\int_0^3 |x^2-4|\,dx$

2. Find a formula for $F(x) = \displaystyle\int_1^x 3t^4 + 2t\,dt$. Find $F'(x)$.

3. Find $\dfrac{d}{dx}\displaystyle\int_3^x \sin(t^2)\,dt$.

4. Let y be the function that satisfies $\dfrac{dy}{dx} = \cos(x^3)$ and $y(2) = 6$. Fill in the blanks below.

$$y(x) = \square + \int_{\square}^{\square} \square\, dt$$

5. A chemical spill results in the contamination of a pond. At time t hours after 8:00AM, the rate at which the chemical is entering the pond is $600 - 50t$ gallons per hour. How many gallons of the chemical entered the pond between 10:00AM and 1:00PM? between 1:00PM and 4:00PM?

6. The rate at which a savings account earns interest is $100e^{0.05t}$ dollars per year, where t is the time in years after the account is opened. How much interest did the account earn during the first year? during the second year? during the third year?