Chapter 6.2: Finding Anti-Derivatives Analytically

Calculus II
Spring 2021
College of the Atlantic

1. Take the **derivative** of the following functions:

   (a) $f(x) = \frac{1}{x}$

   (b) $f(x) = \sqrt{x} + 4x^{3/2}$

   (c) $f(x) = 2e^x$

   (d) $f(x) = 2^x$

   (e) $f(x) = 2\sin x$

   (f) $f(x) = \ln(x)$

2. Find the following **anti-derivatives**:

$$\int 4x \, dx \tag{1}$$

$$\int \frac{4}{x} \, dx \tag{2}$$

$$\int (y + y^2 + y^3) \, dy \tag{3}$$

$$\int 2\sin(x) \, dx \tag{4}$$

$$\int 4t \, dt \tag{5}$$

$$\int \ln(x) \, dx \tag{6}$$

3. Find the following **definite integrals**:

$$\int_1^3 4x \, dx \tag{7}$$

$$\int_1^3 4t \, dt \tag{8}$$

$$\int_0^{\pi/2} \cos(x) \, dx \tag{9}$$

$$\int_0^{2\pi} \cos(x) \, dx \tag{10}$$

$$\int_0^2 y^5 \, dy \tag{11}$$

$$\int_{-2}^2 y^5 \, dy \tag{12}$$