UNIVERSITY OF MANITOBA

MATH 1700 D01

Assignment 1

1.
Use the form of the integral given in Theorem 4 section 5.2 to evaluate

$$\int_0^3 (6x^2 + 2x + 4)\,dx.$$

2.
Let

$$f(x) = \begin{cases} 2 & \text{for} \quad -1 \le x \le 1 \\ 3 - x & \text{for} \quad 1 < x < 4 \\ 2x - 9 & \text{for} \quad 4 \le x \le 5. \end{cases}$$

Sketch the graph of f on the interval $[-1, 5]$ and evaluate $\int_{-1}^{5} f(x)\,dx$.

3.
Find the derivative $\dfrac{d}{dx}\displaystyle\int_{3x}^{x^3} (t^3 + 1)^{10}\,dt$.

4.
Evaluate

(a) $\displaystyle\int x^3(x^2 + 4)^{1/2}\,dx$

(b) $\displaystyle\int \frac{dx}{x^{2/3}(\sqrt[3]{x} + 1)}$

(c) $\displaystyle\int_1^2 \frac{e^{1/x}}{x^2}\,dx$

(d) $\displaystyle\int_0^2 x\sqrt{2x + 1}\,dx.$