

MEMORIAL UNIVERSITY OF NEWFOUNDLAND

DEPARTMENT OF MATHEMATICS AND STATISTICS

ASSIGNMENT 4

MATHEMATICS 1001

WINTER 2025

Due: Monday, March 3rd, 2025 at 11:59pm. See the Gradescope Handout for submission information.

Note: You should complete Worksheet 2.1 and Worksheet 2.2 before you work on this assignment.

- Use the limit of a Riemann sum to determine the area A of each of the following regions. (In each case, use a regular partition and let the sample point $x_i^* = x_i$, that is, the right endpoint of the i th subinterval.)
 - The region under the curve $f(x) = (x - 4)^2$ on the interval $[-2, 4]$.
 - The region under the curve $f(x) = x^3 + x^2 + x + 1$ on the interval $[-1, 1]$.
- Consider the line $y = mx + b$ for any $m < 0$ and $b > 0$. Together with the x - and y -axes, the graph of this line forms a right triangle. Use the limit of a Riemann sum to show that the area of this triangle is given by $A = -\frac{b^2}{2m}$.
- Evaluate $\int_0^{\frac{3}{2}} 2x(4 - 3x) dx$ by computing the limit of a Riemann sum.