ASSIGNMENT 4 **MATHEMATICS 1001** WINTER 2024

Due: Monday, February 26th, 2024 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.

1. 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 ith subinterval.)

   (a) The region under the curve $f(x) = x^2 - 3x + 6$ on the interval $[-2, 4]$.

   (b) The region under the curve $f(x) = x^2(x + 2)$ on the interval $[0, \frac{1}{3}]$.

2. Consider the region R which lies under the curve $f(x) = \sqrt{x}$ on the interval $[0, 16]$. Use the Riemann sum definition of the definite integral to find the area A of R. Instead of a regular partition, let the right endpoint of the ith subinterval is $x_i = \dfrac{16i^2}{n^2}$, and use it as the sample point x_i^*.

3. Evaluate $\displaystyle\int_{-2}^{1} (x - 1)^2 \, dx$ by computing the limit of a Riemann sum.