MEMORIAL UNIVERSITY OF NEWFOUNDLAND

DEPARTMENT OF MATHEMATICS AND STATISTICS

TEST 2 **MATHEMATICS 1001** November 21st, 2025

Name	**MUN Number**

[7] 1. (a) Use the definition of the definite integral as a limit of a sum to evaluate

$$\int_1^3 (x^2 + 2x - 3)\, dx.$$

[3] (b) Check your answer to part (a) using the Fundamental Theorem of Calculus.

[10] 2. Evaluate each of the following definite integrals.

(a) $\displaystyle\int_0^{\pi} \sin^3\left(\frac{x}{4}\right)\cos\left(\frac{x}{4}\right)\,dx$

(b) $\displaystyle\int_{-1}^{1} |2x-1|\,dx$

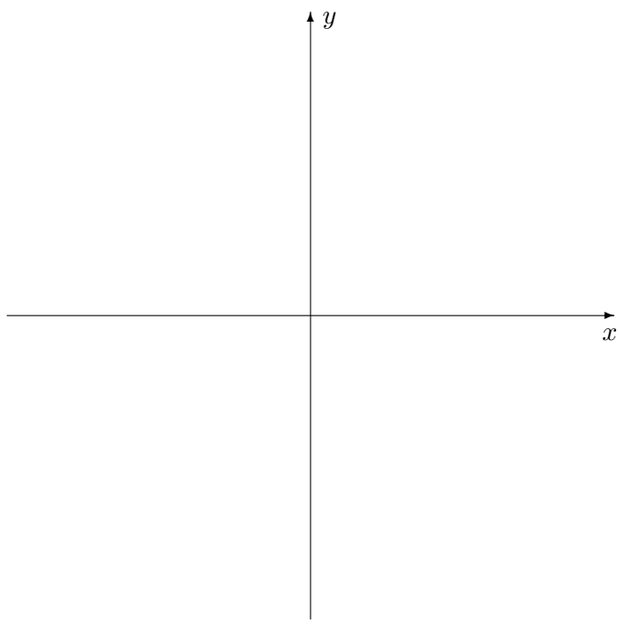
[11] 3. Use any appropriate method to integrate each of the following.

(a) $\displaystyle\int \frac{3x^2-2x+14}{(x-1)(x^2+4)}\,dx$

(b) $\int \sin^5(x)\cos^2(x)\,dx$

[9] 4. Consider the region R bounded by the curves $y = 2 - x$, $y = \sqrt{x}$ and the x-axis.

(a) Sketch the graph of the region R on the axes provided.



(b) Set up, but **DO NOT EVALUATE**, an integral (or a sum of integrals) with respect to x which represents the area of R.

(c) Set up, but **DO NOT EVALUATE**, an integral (or a sum of integrals) with respect to y which represents the area of R.