MEMORIAL UNIVERSITY OF NEWFOUNDLAND DEPARTMENT OF MATHEMATICS AND STATISTICS

Assignment 8

MATHEMATICS 1001

WINTER 2025

Due: Monday, March 31st at 11:59pm. See the Gradescope Handout for submission information.

Note: You should complete both Worksheet 3.3 and 3.4 before you work on this assignment.

1. Use trigonometric substitution to evaluate each of the following.

(a)
$$\int \frac{1}{x\sqrt{x^2+9}} dx$$

(b) $\int_{1}^{\sqrt{2}} \frac{x^2}{\sqrt{4-x^2}} dx$

2. Evaluate each of the following improper integrals, or show that it is divergent.

(a)
$$\int_{0}^{2} \ln\left(\frac{x}{2}\right) dx$$

(b)
$$\int_{3}^{\infty} \frac{1}{x^{2} - 4} dx$$