University of Toronto at Scarborough
Department of Computer and Mathematical Sciences

MATA37 Winter 2025

Assignment # 6

You are may wish to work on this assignment prior to your tutorial during Mon. Feb. 24th and the week of June 24th. You may ask questions about this assignment in that tutorial.

STUDY: Chapter 5: Section 5.3; 5.4 (OMIT anything with hyperbolic trig); 5.5. Section 5.5

HOMEWORK:

At the beginning of your TUTORIAL during the week of March 3rd you will write a quiz based on this assignment, lectures and textbook readings. This part of your assignment will count towards the 20% of your final mark, which is based on weekly assignments / quizzes.

1. Evaluate using any of our 5 techniques. Make sure to appropriately justify.

   (a) $\displaystyle\int \frac{5x-10}{x^2-3x-4}\,dx.$

   (b) $\displaystyle\int \frac{xe^x}{(x+1)^2}\,dx.$

   (c) $\displaystyle\int \frac{x^2+x-2}{3x^3-x^2+3x-1}\,dx.$

   (d) $\displaystyle\int \frac{2x^2-1}{(4x-1)(x^2+1)}\,dx.$

   (e) $\displaystyle\int_1^{\sqrt{2}} \frac{dx}{x^2\sqrt{4-x^2}},\ |x|<2.$

   (f) $\displaystyle\int \frac{\sqrt{x^2-25}}{x}\,dx,\ |x|\geq 5.$

(g) $\displaystyle\int \frac{x}{x^2-4x+8}\,dx.$

Hint: complete the square when a quadratic is present and no integration technique characteristic is visible!

(h) $\displaystyle\int_1^2 \frac{x^3+4x^2+x-1}{x^3+x^2}dx.$ *Hint: first polynomial long divide and simplify*

(i) $\displaystyle\int_0^1 \frac{1}{1+x^2}dx$

Our greatest weakness lies in giving up. The most certain way to succeed is always to try just one more time. – *Thomas A. Edison*