MTH240 Midterm 1

Practice/Specimen Paper 2

Ryerson University Midterm 1 – Winter 2022 MTH 240

RU EMAIL: _____ SIGNATURE_____

Date and Time: February XXX, 2022, 6:00 pm (Time allowed: 120 Minutes)

Section (Circle)						
Instructor 1	1	2	3	4		
Instructor 2	5	6	7	8	9	10
Instructor 3	11	12	13	14	15	16
Instructor 4	17	18	19	20	21	22
Instructor 5	23	24	25	26	27	28

Instructions

1. Calculators, notes, and other aids are not allowed.
2. Answer all questions in this booklet. If you need extra room, use 2 pages, clearly indicating where your answer continues. ANYTHING WRITTEN ON THE BACK OF ANY PAGE WILL NOT BE MARKED.
3. In every question, show your work, presented clearly and in the correct order. Unjustified answers will be given little or no credit.
4. Cross out all irrelevant or incorrect work, as marks may be deducted for work, which is misleading, irrelevant, or incorrect.
5. Make sure your test paper is complete; there are 6 questions on 9 pages (including this one). The final 2 pages are given for extra space and do NOT contain questions.

10 marks

1. Evaluate the following integral using integration by parts [Use of any equally valid other method will receive no credit].

$$\int_0^1 x(x+3)^3 dx$$

10 marks

2. Evaluate.

$$\int \sin^2(10x)\cos^2(10x)\ dx$$

15 marks

3. (a) Evaluate the following integral.

$$\int \tan^4(x)\sec(x)\,dx$$

(b) Evaluate the following integral.

$$\int \tan^5(x)\sec^4(x)\,dx$$

(c) Evaluate the following integral.

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

(d) Evaluate the following integral.

$$\int \sin^3(x)\cos^{19}(x)\,dx$$

12 marks

4. Evaluate

$$\int \frac{15}{\sqrt{16x^2 - 49}}\,dx$$

13 marks

5. Discuss whether the following integral is a proper or an improper integral.

$$\int_1^2 \frac{1}{(1-x)^2}\,dx$$

If the integral is an improper integral, then determine whether it converges or diverges.