HO CHI MINH CITY INTERNATIONAL UNIVERSITY

FINAL EXAMINATION

Academic year 2020-2021, Semester 2

SUBJECT: Analysis I (MAFE101IU)	
Head of the Department of Mathematics Professor Pham Huu Anh Ngoc	Lecturer: Pham Huu Anh Ngoc Signature:

Instructions:

- **Send your solution to hiletr1985@gmail.com**
- **Subject of your email must include your full name, student ID and Sol-Q1**
- **Duration: 10 minutes (including time for submitting solution)**
- **Any delay in submission of solution will lead to a reduction in marks**

Question 1. (15 marks) Evaluate the following limit

$$\lim_{x\to 1} \frac{x^{2021} - 2021x + 2020}{(x-1)^2}$$

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Question 2. (20 marks) Find the maximum value and the minimum value of the following function

$$f(x) = \sqrt{x+1} + \sqrt{3-x}, \qquad x \in [-1, 3].$$

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- **Send your solution to hiletr1985@gmail.com**
- **Subject of your email must include your full name, student ID and Sol-Q4**
- **Duration: 25 minutes (including time for submitting solution)**
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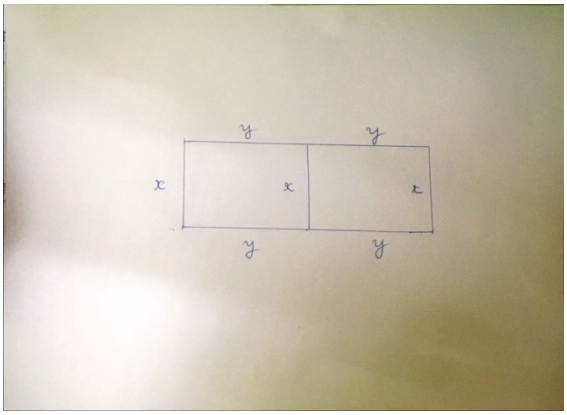
Question 4. (25 marks)

Suppose you have to fence two rectangular fields with the same dimensions, with one side in common, using 180 meters of fencing. Find the dimensions of the rectangles so that the total fenced area is maximum.



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Question 3. (20 marks)

Write the equation of the line tangent to the curve $\sin(x+y) = 2x - 2y$ at the point (π, π).

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Question 5. (15 marks)

Let

$$f(x) = x^8 + (m-1)x^5 - (m^2-1)x^4 + 1,$$

where $m \in \mathbb{R}$ is a parameter.

Find m so that f has a local minimum at $x = 0$.