BRAC UNIVERSITY

Inspiring Excellence

Department of Mathematics and Natural Sciences

MAT 110

MID ASSIGNMENT

SUMMER 2021

SET: 15(FAB)

Please write your name and ID on the first page of the assignment answer script. The deadline is 30th july, 9.00 am to 10.30 am. Solve all problems.

You can only submit a PDF file - image or doc files won't be accepted. Before submitting the PDF, please rename the PDF file in the format - SET_ID_SECTION.

Answer the questions by yourself. Plagiarism will lead to an F grade in the course. ***Total marks is 250.*** *It will be converted to 20. If you have issues with the questions, please contact FAB on Slack.*

1. Determine whether $f(x) = |x + 1|$ is continuous at $x = -1$.

2. Find the differentiation $(\frac{dy}{dx})$ using definition with limit of the following: $y = \dfrac{-2x}{5x - 2}$.

3. Find $\dfrac{dy}{dx}$ of the function $y(x) = \frac{\tan^{-1}(2x)}{2+x^2}$.

4. Let $f(x) = 5 + 12x - x^3$. Find (a) the open intervals on which f is concave up, (b) the open intervals on which f is concave down and (c) the x-coordinates of all inflection points.

5. Find the Maclaurin series of the function $f(x) = \frac{e^x}{1-x}$.