Department of Mathematics and Natural Sciences

MAT120

Assignment 1

Total marks: 20

Instructions:

1. Please rename your .ipynb file as section_ID_firstname. For instance, a student named Riasat from section 13 with student ID 1612047 would rename his file as 13_1612047_riasat
2. It is advised, whatever platform is used- be it Google Colab/Jupyter Notebook, to save the submission file as .ipynb and upload that accordingly.
3. Students should write their own script. If any indication of copying other's script is found, **both the submission will be rejected.**
4. Submission deadline is **22nd February, 2023.**
5. Any submission after the deadline will **NOT** be graded.

Questions:

1. (7 points) Find the minima and maxima of the following function at a given interval:
   $y = x^4 - \frac{2}{3}x^3 - 2x^2 + 2x$ in the interval [0,3].
   Hints: You may want to use conditional statement to gatekeep the values. However, do not use **solveset()** function.

2. (a) (9 points) Find the minima and maxima of the following functions at a given interval:
   $y = sin(x)$ in the interval $[2\pi, 4\pi]$.
   (b) (4 points) Furthermore, determine the x values at which maxima and minima occurs.

   Hints: Please refer to the **solveset**(*equation*,*variable*,*Interval(num*$_1$,*num*$_2$*)*) function to obtain the value within the given interval. However, **solveset()** does not return the values as an array. Therefore, it may require further processing. Additionally, π is accessed in SymPy as **"sp.pi"**