Sample Report

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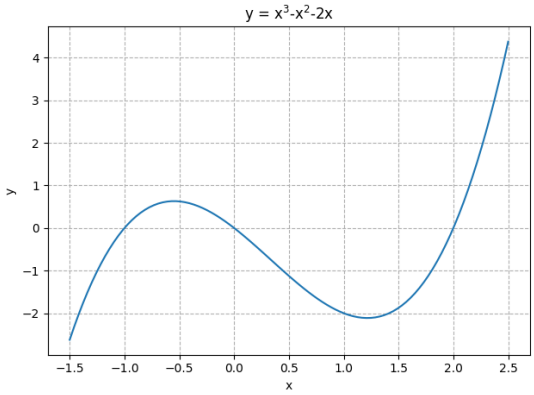
This is my first report being produced on LaTeX.

1 Graphical Representation of Equations

This section shows us a 2-Dimensional and a 3-dimesional graph and explains a bit about it. These were created using Numpy and Matplotlib.

1.1 2D Graph



(a) $y = x^3 - x^2 - 2x$

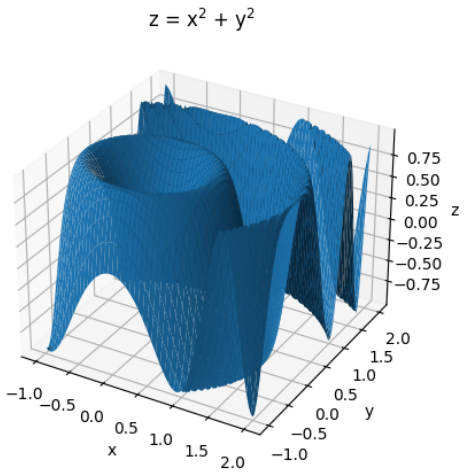
Figure 1(a) shows the equation of the curve:

$$y = x^3 - x^2 - 2x \tag{1}$$

This is a cubic polynomial with 3 real roots. When Factorised, this equation gives us the roots : $2, 0$ and -1, clearly shown in the figure. From this figure, we also can figure out that the maxima of the function is somewhere around $x = -0.5$ and the minima is somewhere between $x = 1$ and $x = 1.5$

1.2 3D Graph

Here, apart from numpy and matplotlib, we also have used mplot3d from matplotlib toolkit for plotting the 3D curve.



(b) $z = sin(2x^2 + 3y^2)$

Figure 1(b) shows the equation of the wave:

$$z = sin(2x^2 + 3y^2) \tag{2}$$

Here, if we see the contour lines in the X-Y plane, we obtain an ellipse of the form $2x^2 + 3y^2 = k$ where k is a constant. The sine of this k value is represented on the z-axis.The domain of Z is always positive since the x and y terms are squared. Thus the values for Z lie from $z = 0$ to $z = 1$ since that is the range of the sine function.