

# Notes: An amalgamation of all things interesting

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# Colour Key and Notation

I am a simple human in a highly stimulating modern world- most of the mathematics notes and textbooks I have seen simply cannot compete with the level of sensory stimulation we are used to. However I have decided \*colour\* is an necessary addition to any set of useful notes.

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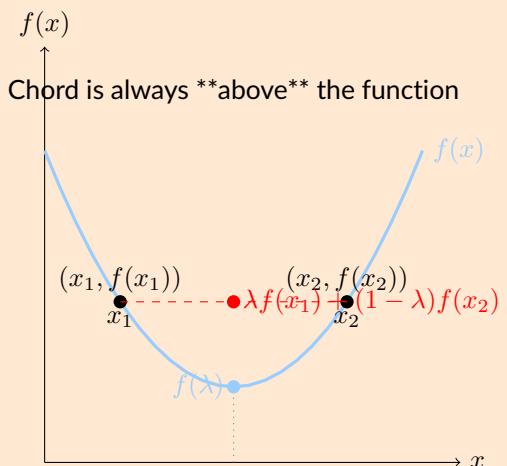
# Chapter 1

## Background Concepts

This section does not aim to provide a rigorous introduction to each concept but rather aims to provide the reader with a functional understanding- enabling them to practically apply the concepts in further problems and areas.

### 1.1 Calculus

#### 1.1.1 Convex Function



## 1.2 Complex Analysis

## 1.3 Linear Algebra

## 1.4 Multivariable Calculus

## 1.5 Useful Tools

### 1.5.1 Convolution

Discrete Series

Continuous

### 1.5.2 Fourier Transform

### 1.5.3 Laplace Transform

### 1.5.4 Z Transform

## 1.6 ODEs

## 1.7 PDEs

# **Chapter 2**

# **Numerics**

## **2.1 Linear Multistep Methods**



## **Chapter 3**

# **Probability**



# **Chapter 4**

# **Statistics**

## **4.1 Linear Regression**

## **4.2 Generalised Linear Models**

### **4.2.1 Exponential Family**

#### **Normal Distribution**

Aiming to write **PDF of the Normal** in the form for an exponential distribution



# **Chapter 5**

# **Machine Learning**

## **5.1 Principal Component Analysis**



# **Chapter 6**

## **Fluids**



## Chapter 7

# Music

*"Music is arithmetic where the soul doesn't know it is counting"*

