

1 Preface

I mainly did nothing today because I had a rough morning, but I decided I want to do something so I started another video in the Linear Algebra playlist.

After hearing censor talk a bit about polynomials I realized i don't know how the general equation for third degree polynomials looks like. The obvious solution, is to try and derive it myself :)

2 Proof

Let $P(x) = ax^3 + bx^2 + cx + d$ for some $a, b, c, d \in \mathbb{R}$. Then we define its roots, as a number x s.t. $P(x) = 0$. We will attempt to find a general equation to find the roots of a third degree polynomial given its coefficients.

$$ax^3 + bx^2 + cx + d = 0$$

$$ax^3 + bx^2 + cx = -d$$

$$x^3 + \frac{bx^2}{a} + \frac{cx}{a} = \frac{-d}{a}$$