

# The linear solution to the canonical elliptic curve

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## Abstract

In this paper, I supply the linear solution to the canonical elliptic curve.  
The paper ends with "The End"

## Introduction

The canonical elliptic curve is

$$y^2 = x^3 + ax + b$$

## The linear solution to the canonical elliptic curve

The linear solution to the canonical elliptic curve is

$$x = \frac{\alpha^2}{3} + \frac{\sqrt[3]{2\alpha^6 + 18\alpha^3\beta - 9a\alpha^2 + \sqrt{4(-\alpha^4 - 6\alpha\beta + 3a)^3 + (2\alpha^6 + 18\alpha^3\beta - 9a\alpha^2 + 27\beta^2 - 27b)^2} + 27\beta^2 - 27b}}{3\sqrt[3]{2}} - \frac{\sqrt[3]{2}(-\alpha^4 - 6\alpha\beta + 3a)}{3\sqrt[3]{2\alpha^6 + 18\alpha^3\beta - 9a\alpha^2 + \sqrt{4(-\alpha^4 - 6\alpha\beta + 3a)^3 + (2\alpha^6 + 18\alpha^3\beta - 9a\alpha^2 + 27\beta^2 - 27b)^2} + 27\beta^2 - 27b}}$$

$$y = \alpha x + \beta$$

where

$\alpha$  and  $\beta$  are constants such that  $x$  and  $y$  are well-defined.

## The End