Chapter 2

Cubics and the group law

2.1 Examples of parametrised cubics

Some plane cubic curves can be parametrised, just as the conics:

Nodal cubic $C : (y^2 = x^3 + x^2) \subset \mathbb{R}^2$ is the image of the map $\varphi\colon \mathbb{R}^1 \to \mathbb{R}^2$ given by $t \mapsto (t^2 - 1, t^3 - t)$ (check it and see);

Cuspidal cubic $C : (y^2 = x^3) \subset \mathbb{R}^2$ is the image of $\varphi\colon \mathbb{R}^1 \to \mathbb{R}^2$ given by $t \mapsto (t^2, t^3)$:

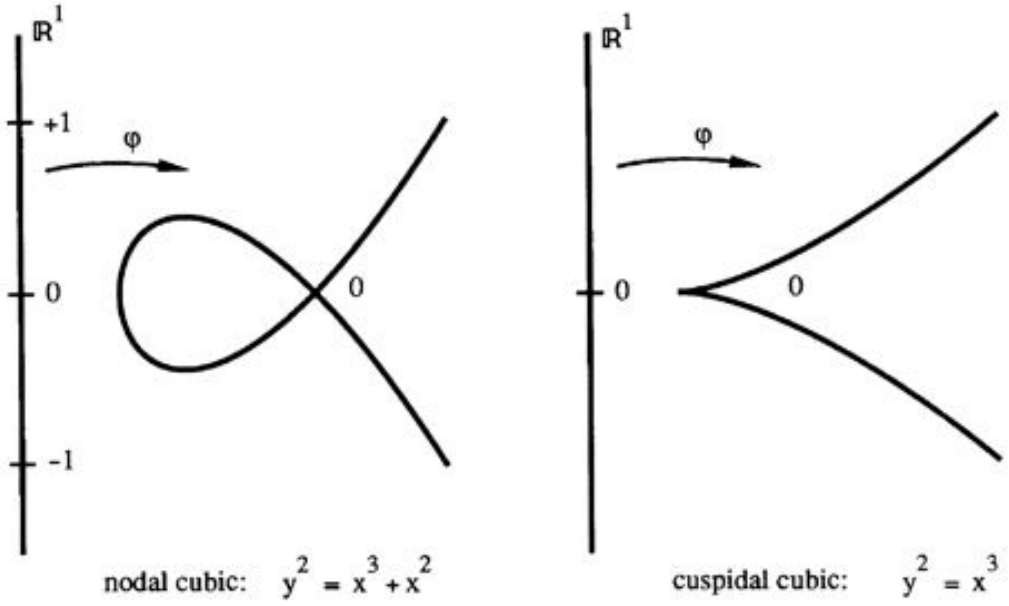

Figure 2.1: Parametrised cubic curves