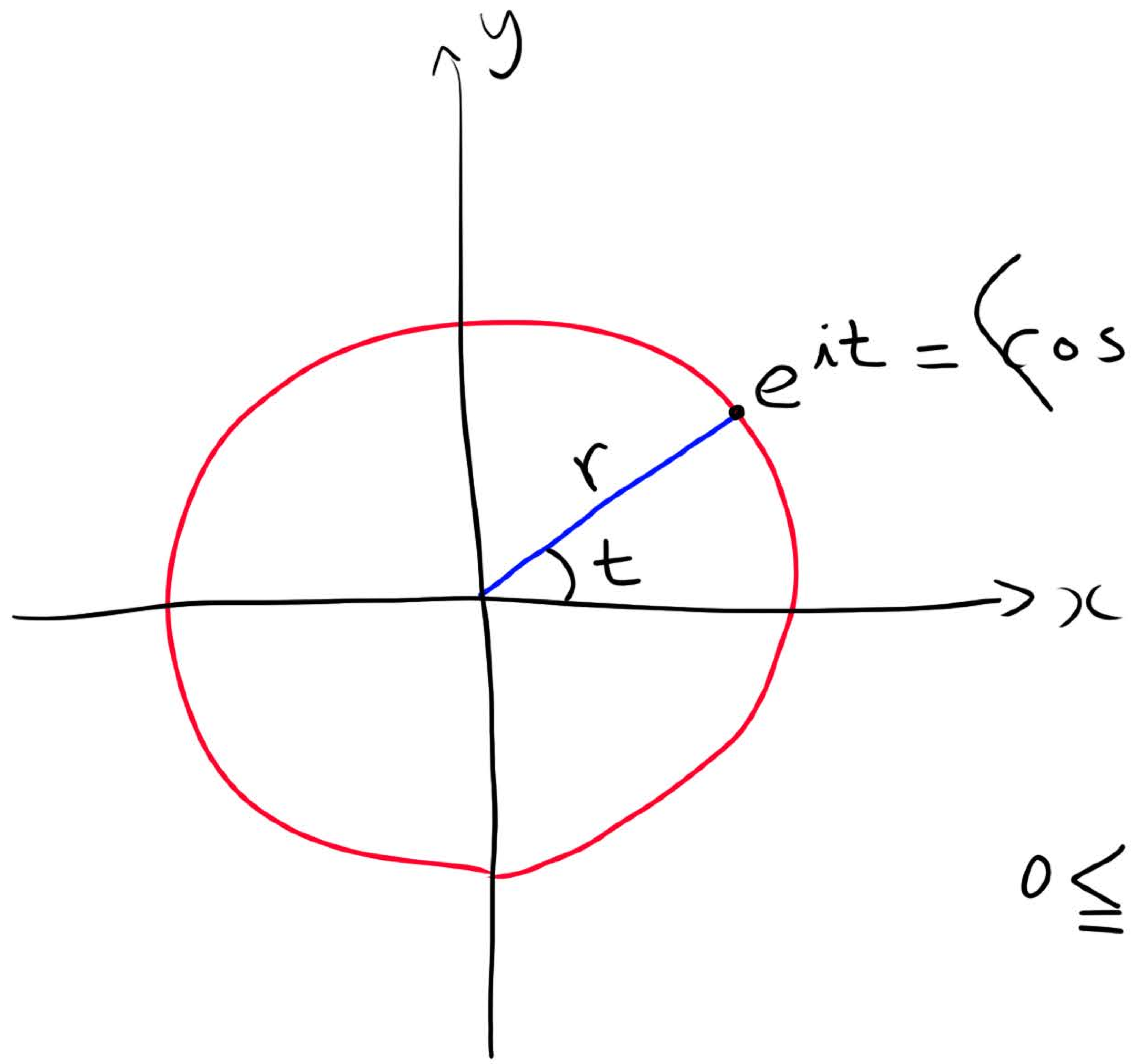
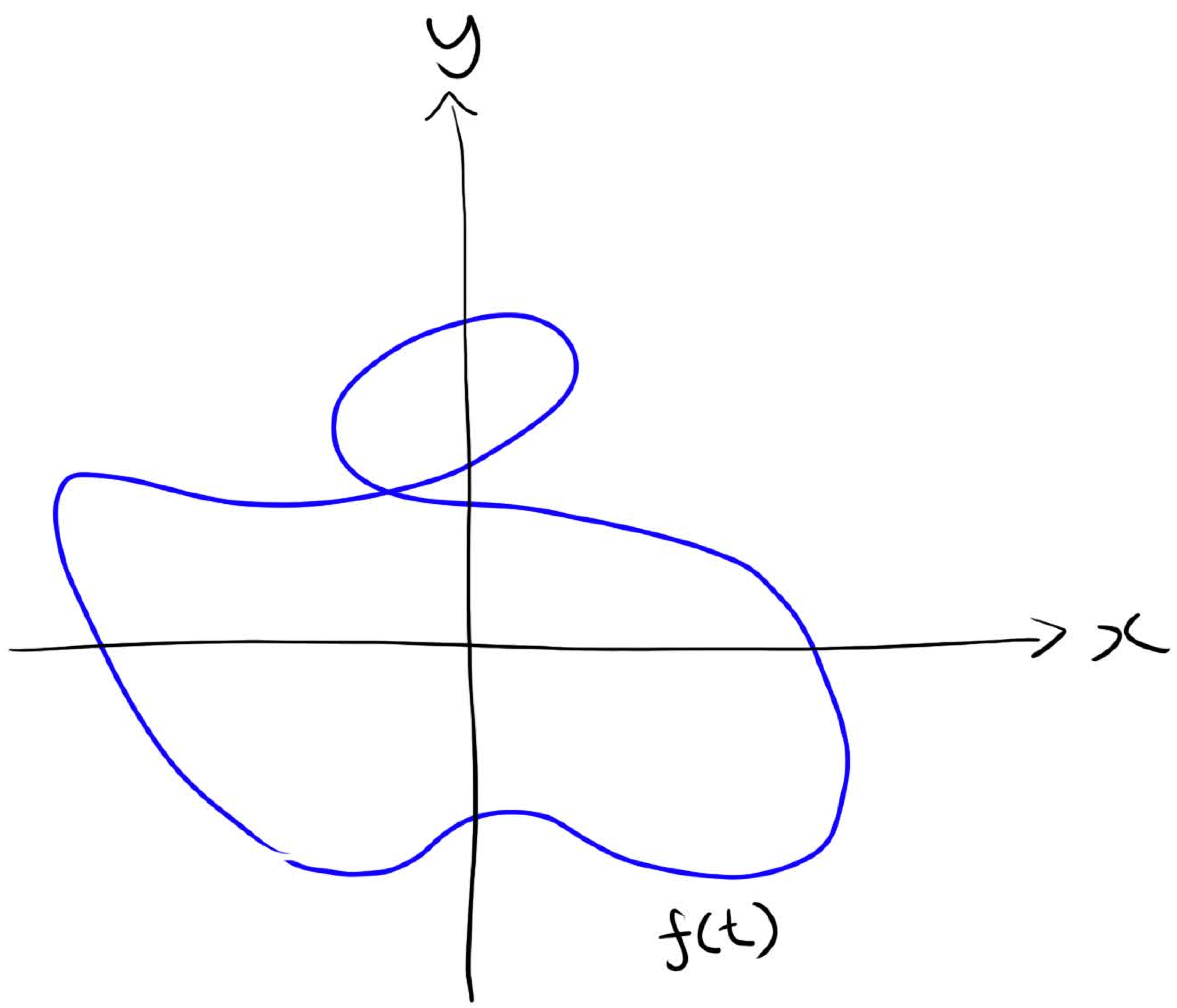


$$e^{it} = (\cos t + i \sin t) \times r$$

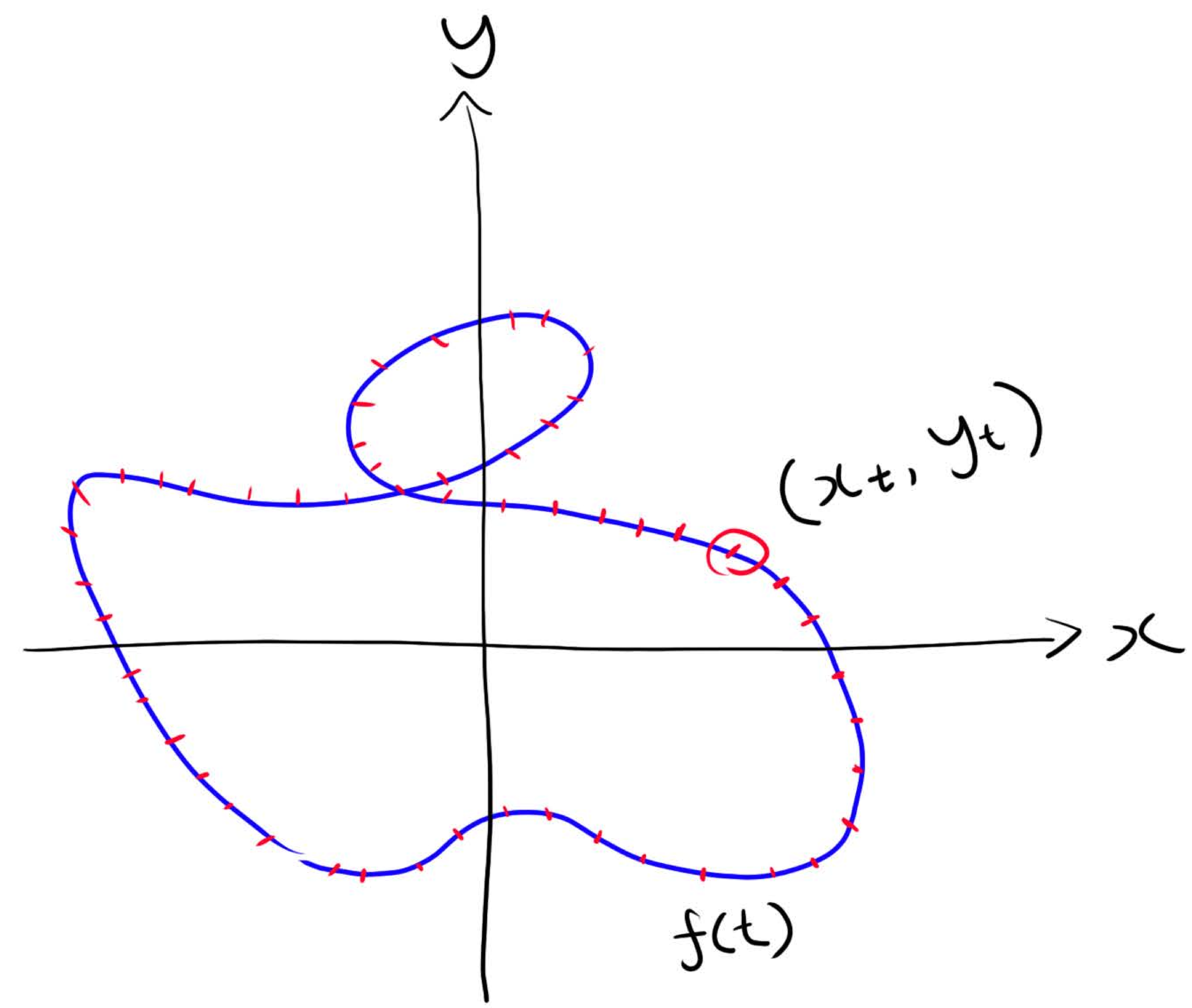
$$0 \leqq t < 2\pi$$



$$
\begin{aligned}
f(t) = \\
&\vdots \\
&+ C_{-3} e^{-3it} \\
&+ C_{-2} e^{-2it} \\
&+ C_{-1} e^{-it} \\
&+ C_{0} e^{0} \\
&+ C_{1} e^{it} \\
&+ C_{2} e^{2it} \\
&+ C_{3} e^{3it} \\
&\vdots
\end{aligned}
$$

$$\rightarrow f(t) = \sum_{n=0}^{\infty} C_n e^{nt}$$

$$f(t) = \sum_{n=0}^{\infty} C_n e^{nt}$$

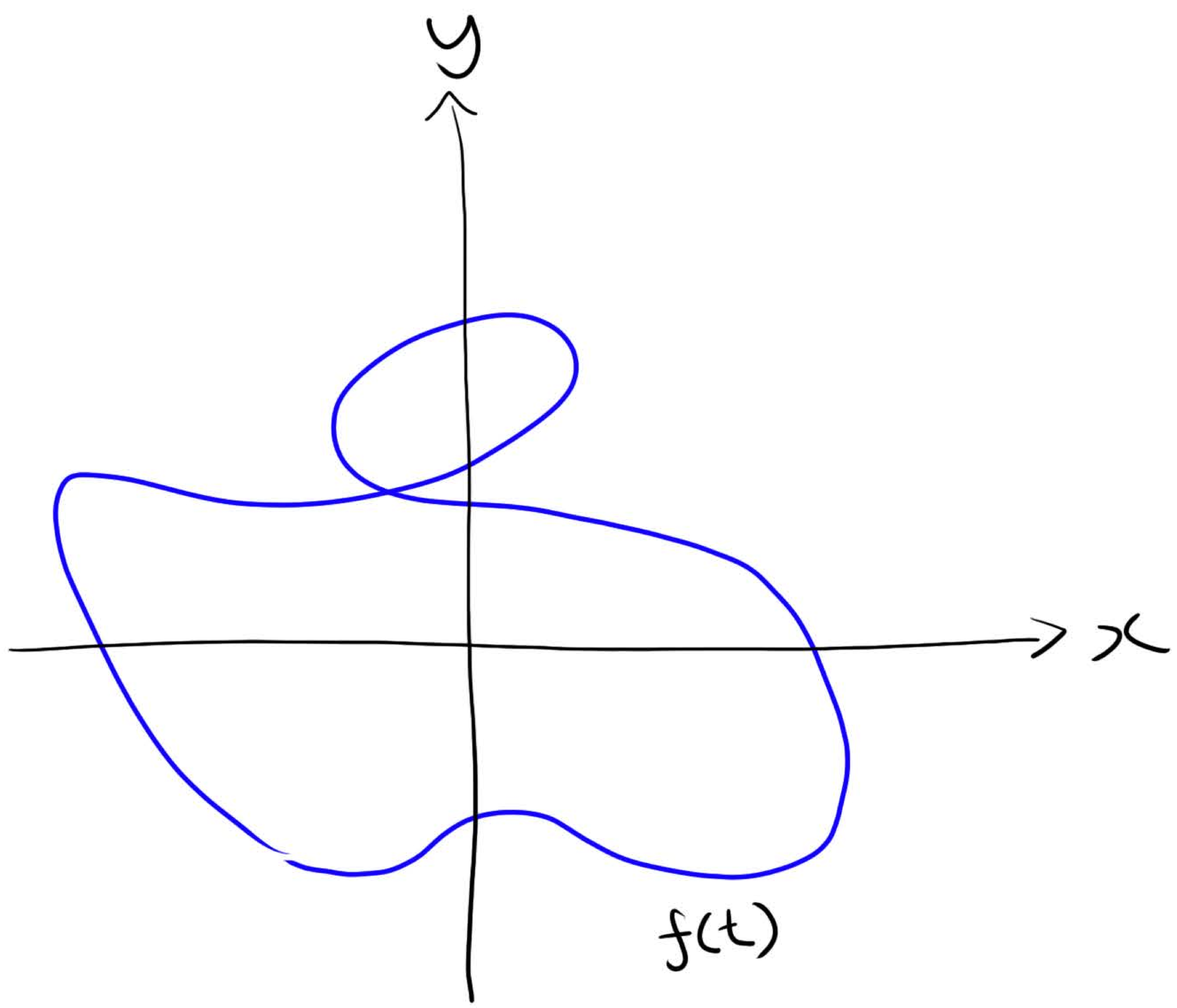


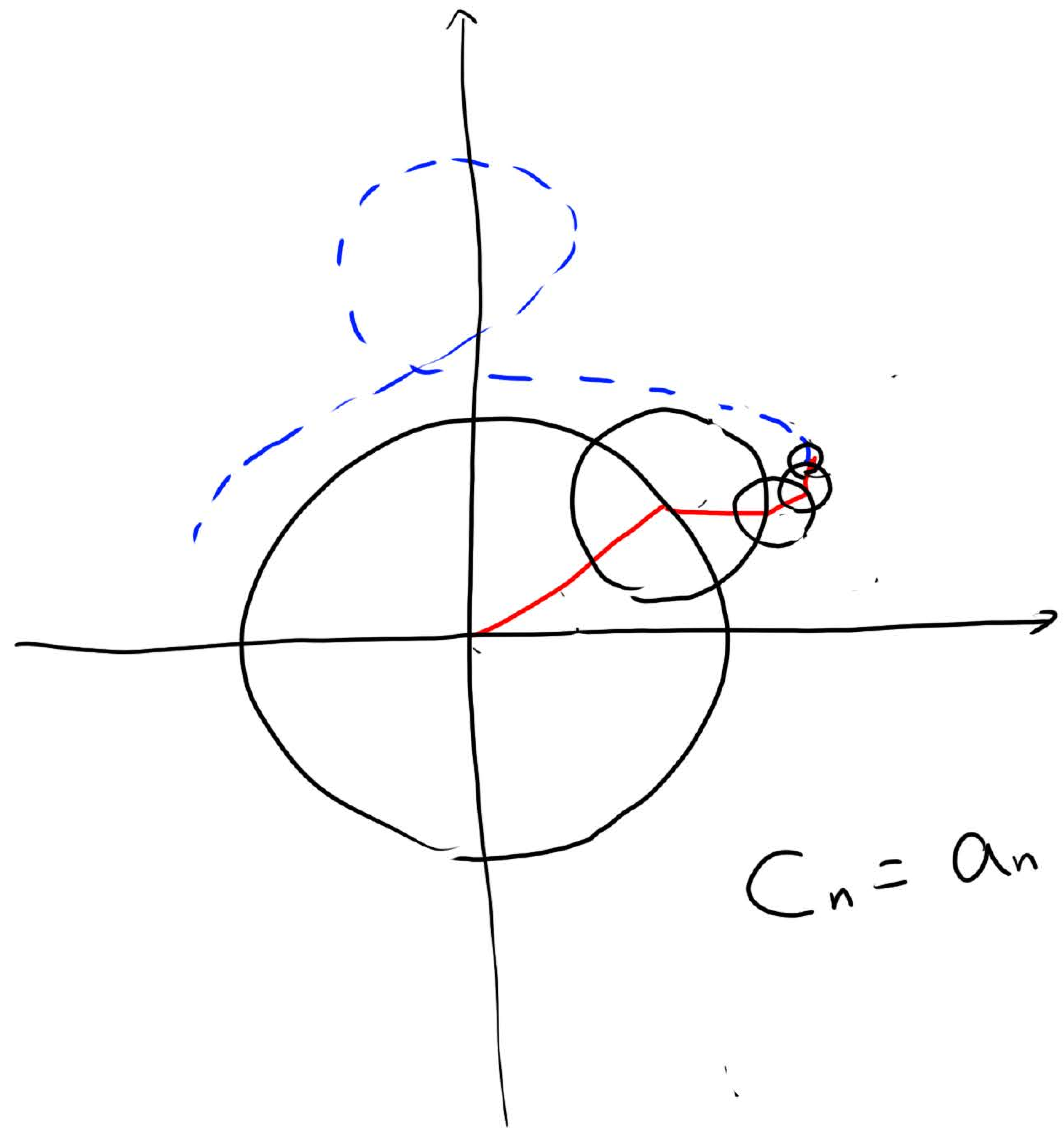
$$C_n = \frac{1}{2\pi} \underbrace{\int_0^{2\pi} f(t) e^{-nit} dt}$$

$$\int_0^{2\pi} (x_t + iy_t)(\cos(-nt) + i \times \sin(-nt)) dt$$

$$= \int_0^{2\pi} (x_t + iy_t)(\cos nt - i \sin nt) dt$$

$$= \int_0^{2\pi} \left(\underbrace{(x_t \cos nt + y_t \sin nt)}_{x \text{ axis}} + i \underbrace{(-x_t \sin nt + y_t \cos nt)}_{y \text{ axis}} \right) dt$$





$$C_n = a_n + b_n i$$