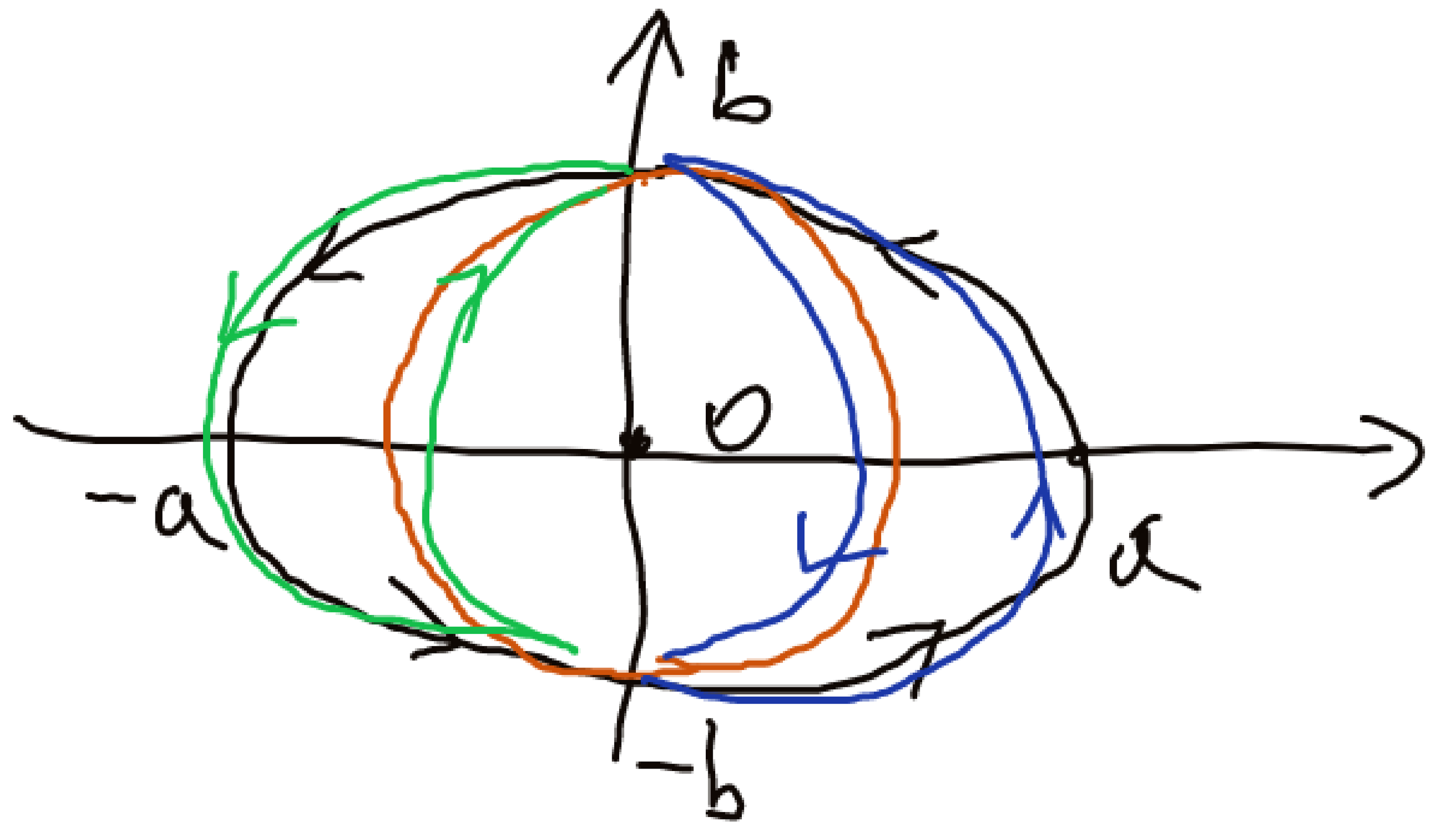
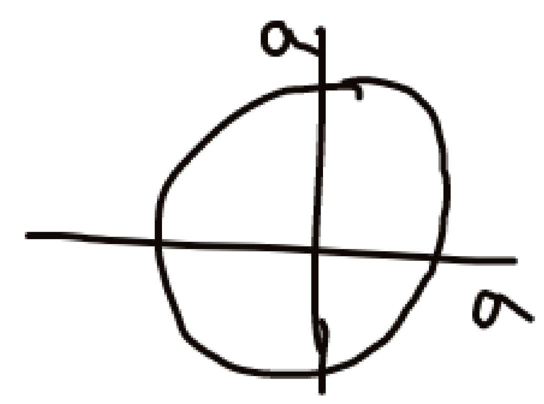
$$\left(\frac{\operatorname{Re} z}{a}\right)^2 + \left(\frac{\operatorname{Im} z}{b}\right)^2 = 1$$



$$\gamma(t) = \underbrace{a\cos t} + i\underbrace{b\sin t}, \quad t\in[0,2\pi]$$

okrąg o p. a i śr. w 0

$$\gamma(t) = ae^{it} = a\cos t + i\,a\sin t, \quad t\in[0,2\pi]$$



• $$\int_\gamma \frac{1}{z}\,dz = \int_0^{2\pi} \frac{1}{a\cos t + ib\sin t}(-a\sin t + ib\cos t)\,dt =$$

$$= \int_0^{2\pi} \frac{(a\cos t - ib\sin t)(-a\sin t + ib\cos t)}{a^2\cos^2 t + b^2\sin^2 t}\,dt =$$

$$= \int_0^{2\pi} \frac{(-a^2\cos t\sin t + b^2\sin t\cos t) + i(ab\cos^2 t + ab\sin^2 t)}{a^2\cos^2 t + b^2\sin^2 t}\,dt =$$

$$= \int_0^{2\pi} \frac{(-a^2+b^2)\sin t\cos t}{a^2\cos^2 t + b^2\sin^2 t}\,dt + i\underbrace{\int_0^{2\pi} \frac{dt}{a^2\cos^2 t + b^2\sin^2 t}\cdot ab}_{I} \quad \Rightarrow \quad I = \frac{2\pi}{ab}$$

•• $$\int_\gamma \frac{1}{z}\,dz = \int_\gamma \frac{1}{z-0}\,dz = 2\pi i\,\operatorname{Ind}_\gamma(0) = 2\pi i$$