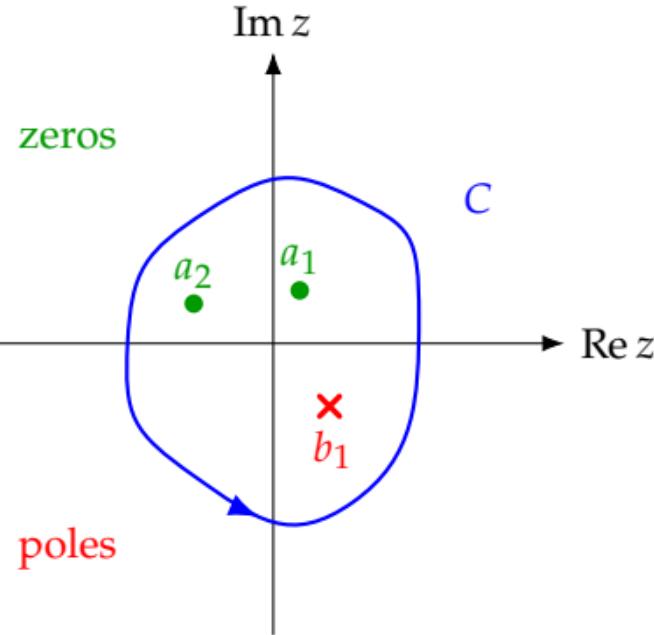
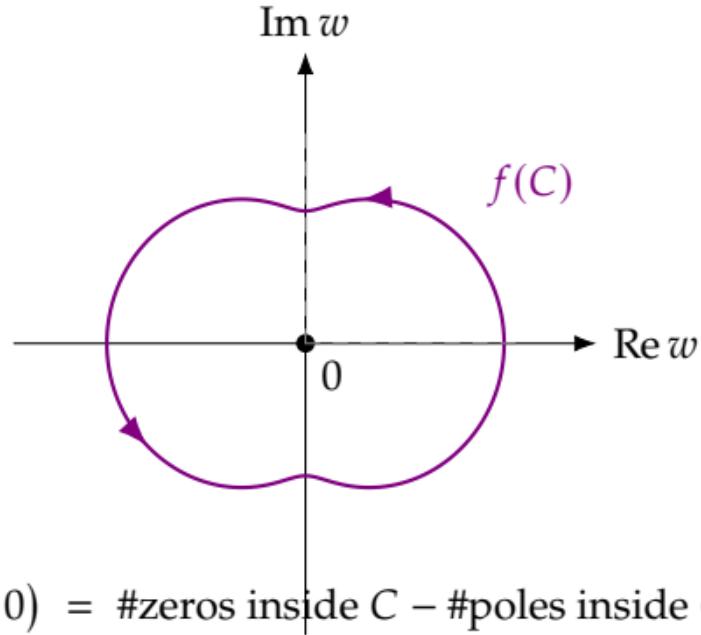


$z$ -plane



$w = f(z)$ -plane



$$\text{wind}(f(C), 0) = \#\text{zeros} \text{ inside } C - \#\text{poles} \text{ inside } C = 1$$

$$\oint_C \frac{f'(z)}{f(z)} dz = 2\pi i \text{wind}(f(C), 0) = 2\pi i (\#\text{zeros} - \#\text{poles}).$$