

$Im(z)$

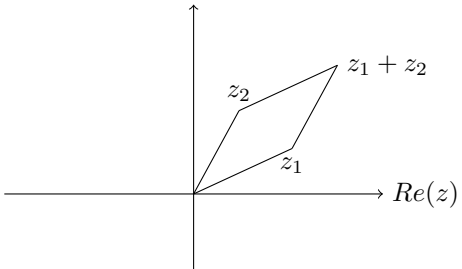


$z_1 + z_2$

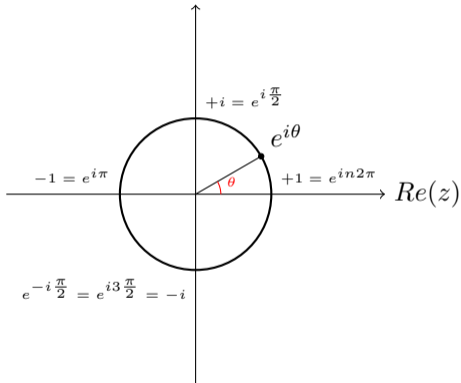
z_2

z_1

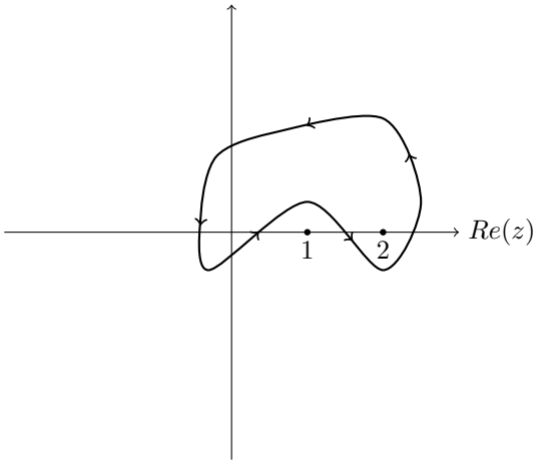
$Re(z)$



$Im(z)$



$Im(z)$



1

2

$Re(z)$

$Im(z)$



positive imaginary axis



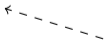
positive real axis



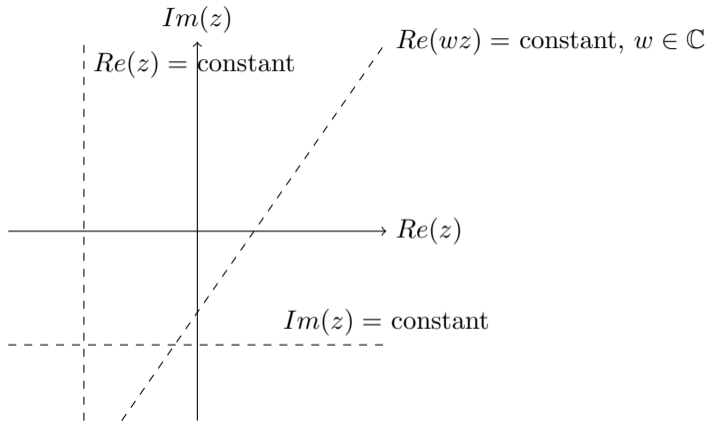
$Re(z)$

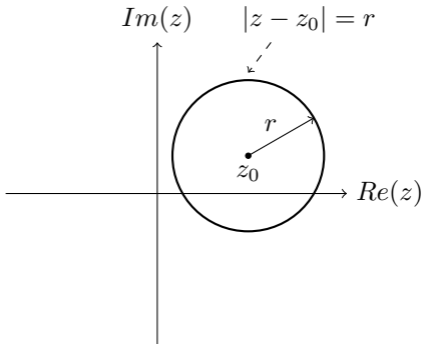


negative real axis

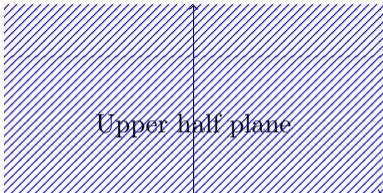


negative imaginary axis

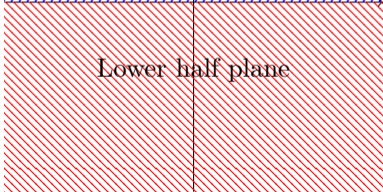




$Im(z)$



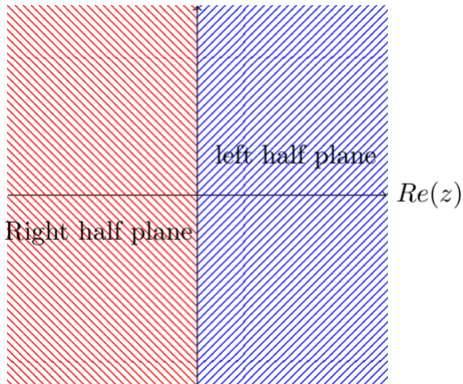
Upper half plane

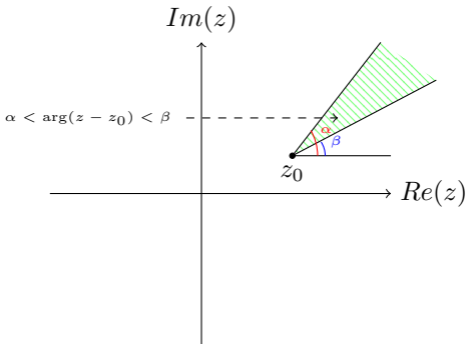


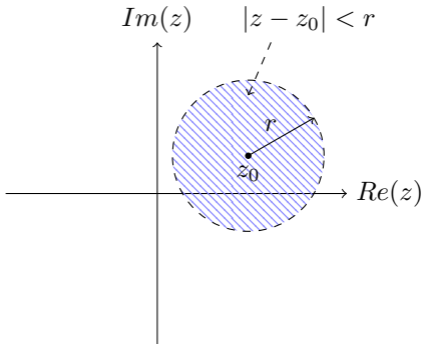
Lower half plane

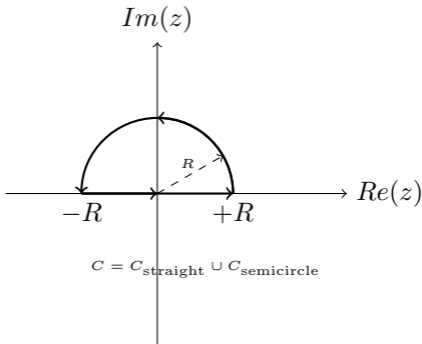
$Re(z)$

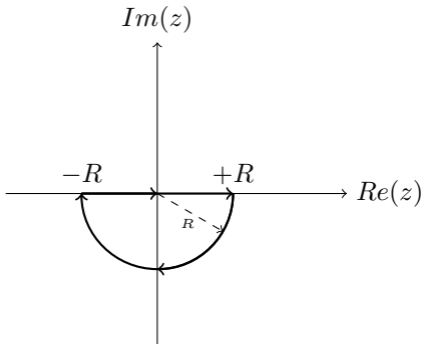
$Im(z)$

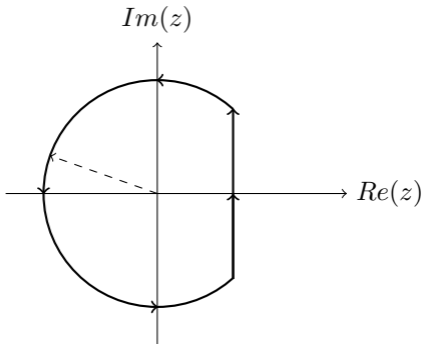


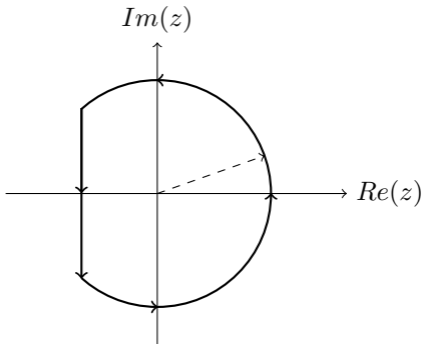


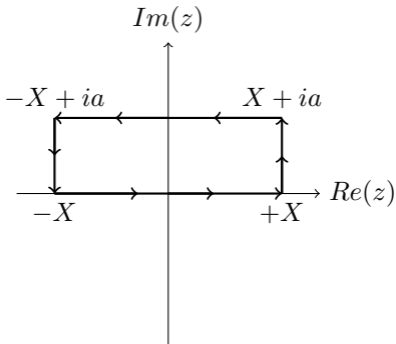




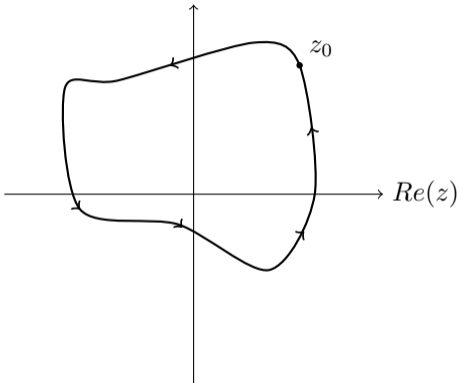


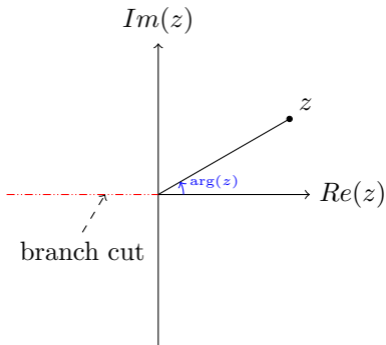


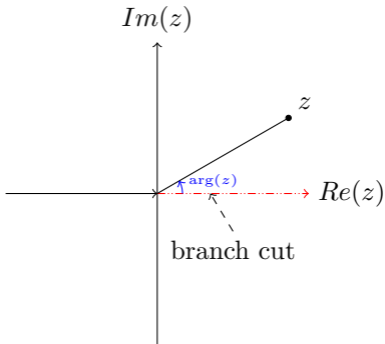


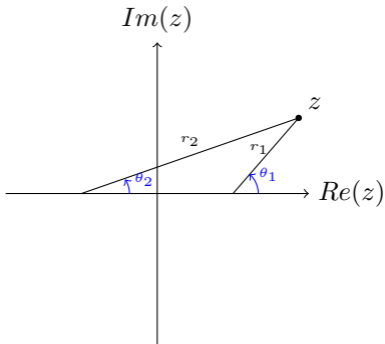


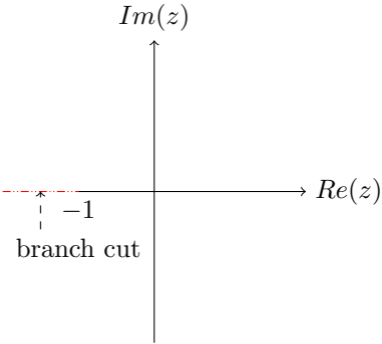
$Im(z)$

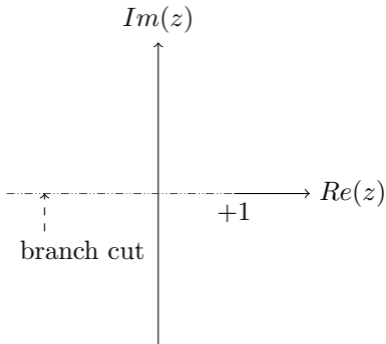


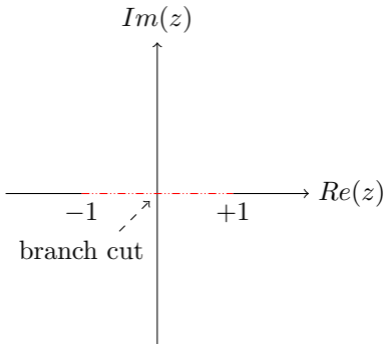


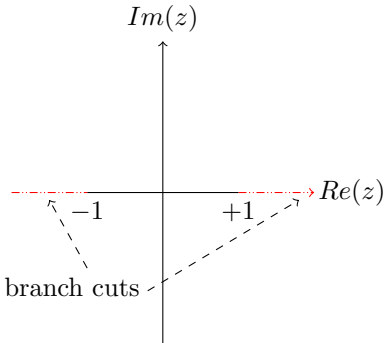




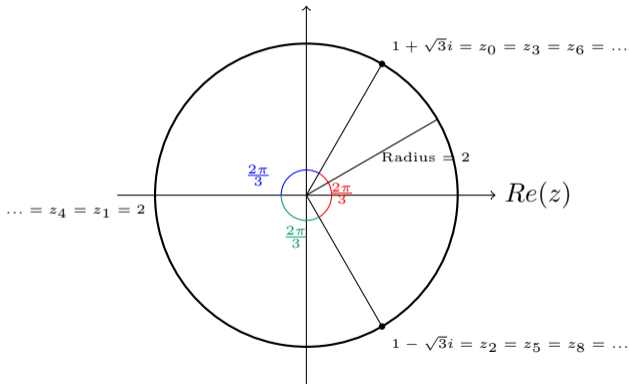








$Im(z)$



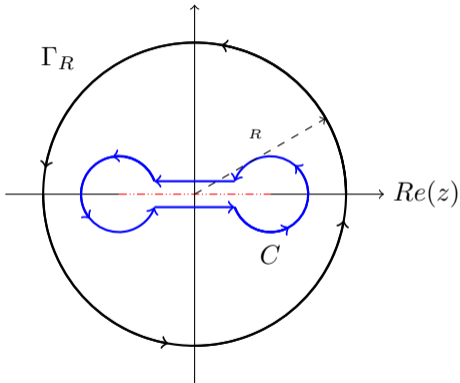
$Im(z)$

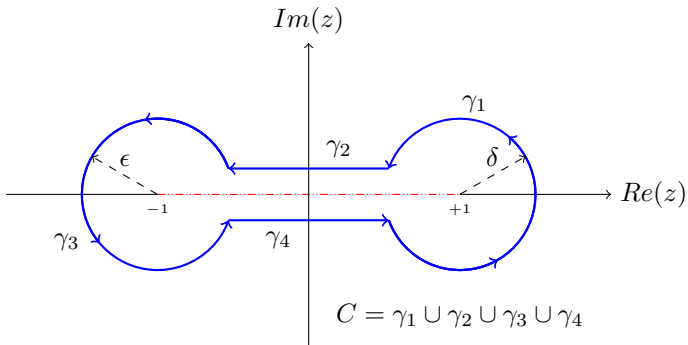
Γ_R

R

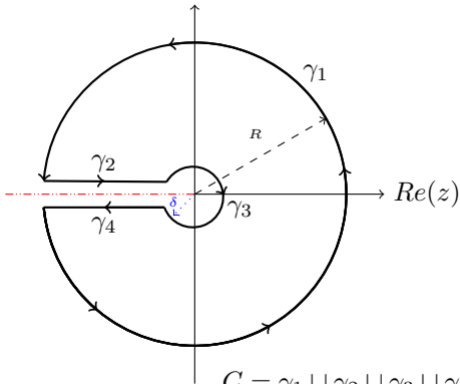
$Re(z)$

C



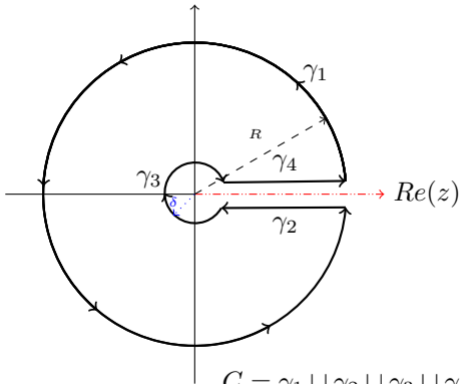


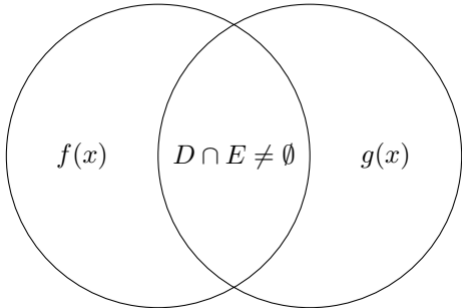
$Im(z)$

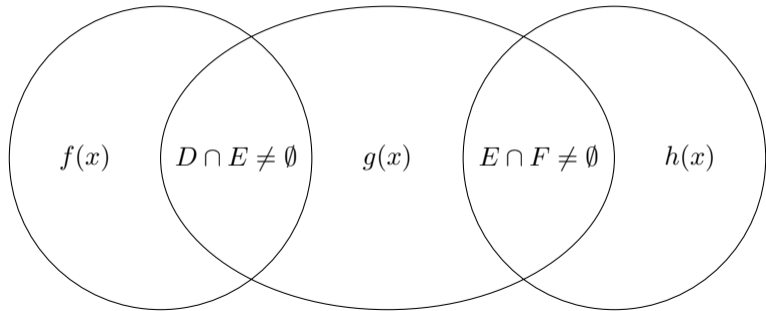


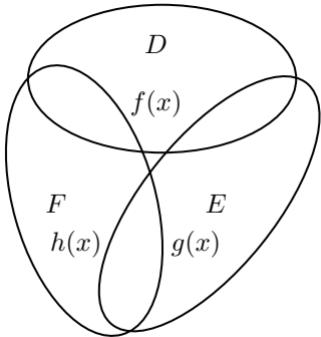
$$C = \gamma_1 \cup \gamma_2 \cup \gamma_3 \cup \gamma_4$$

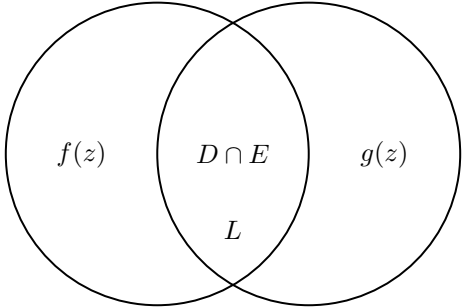
$Im(z)$



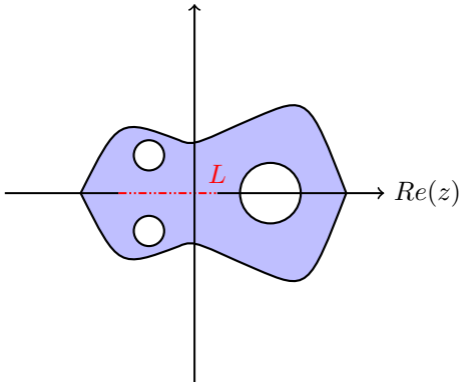
D E $f(x)$ $D \cap E \neq \emptyset$ $g(x)$ 

D E F $f(x)$ $D \cap E \neq \emptyset$ $g(x)$ $E \cap F \neq \emptyset$ $h(x)$ 



D E $f(z)$ $D \cap E$ $g(z)$ L 

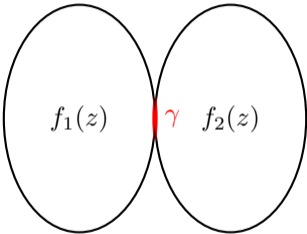
$Im(z)$



$Re(z)$

D_1

D_2

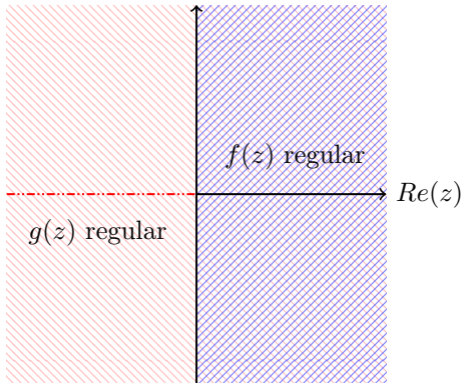


$f_1(z)$

γ

$f_2(z)$

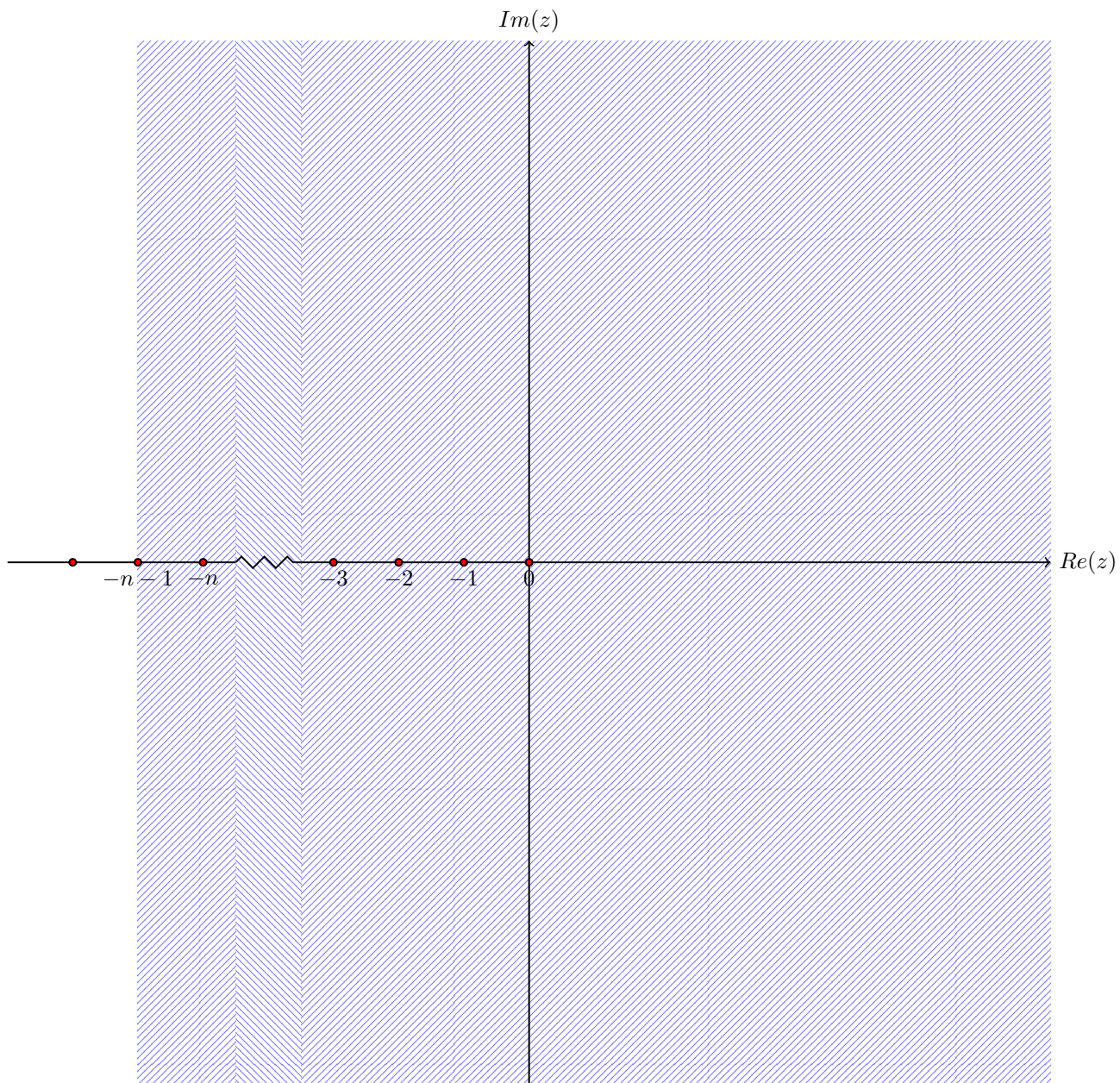
$Im(z)$

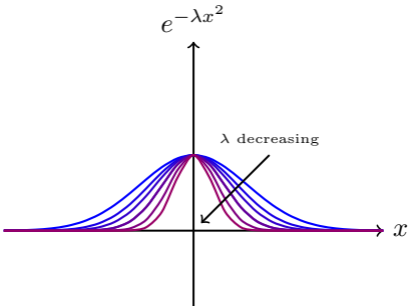


$f(z)$ regular

$Re(z)$

$g(z)$ regular





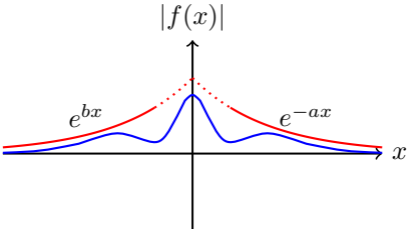
$$e^{-\frac{k^2}{4\lambda}}$$



λ increasing



k

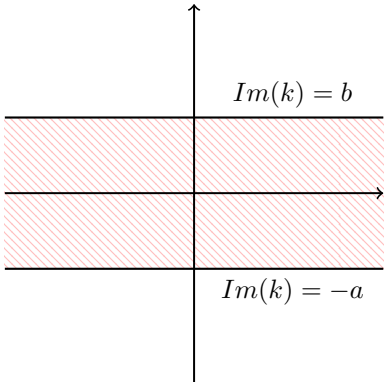


$Im(k)$

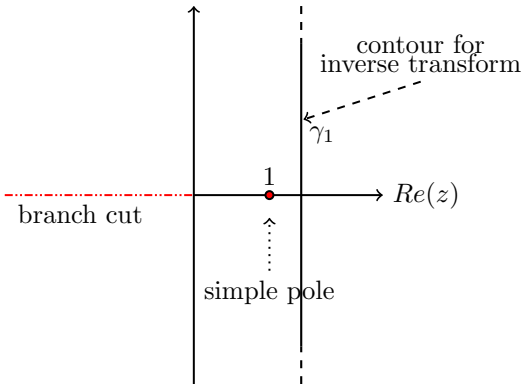
$Im(k) = b$

$Re(k)$

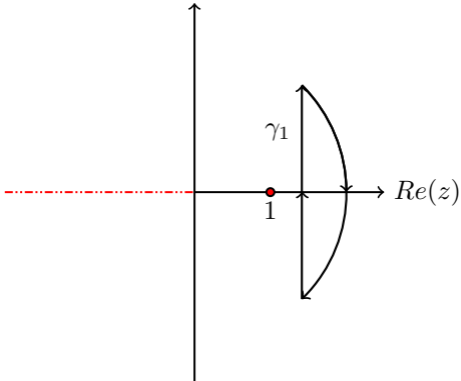
$Im(k) = -a$



$Im(z)$



$Im(z)$

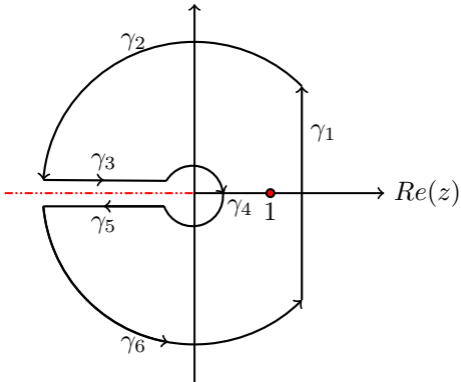


γ_1

1

$Re(z)$

$Im(z)$



γ_1

γ_3

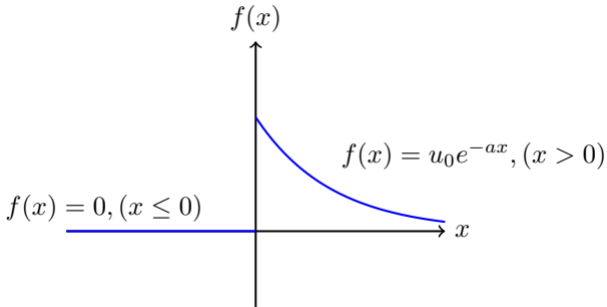
γ_4

γ_5

1

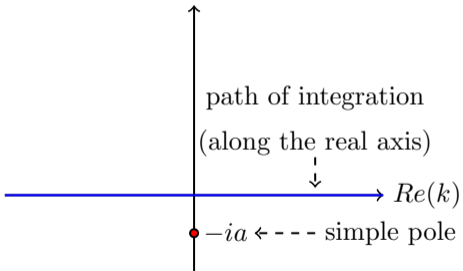
γ_6

$Re(z)$



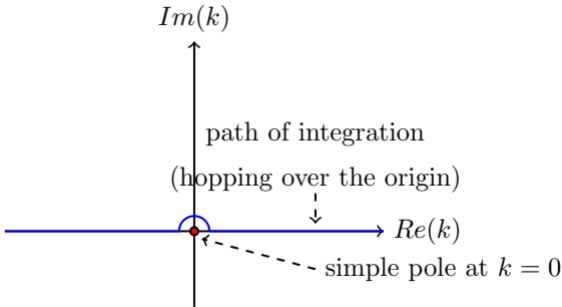
$Im(k)$

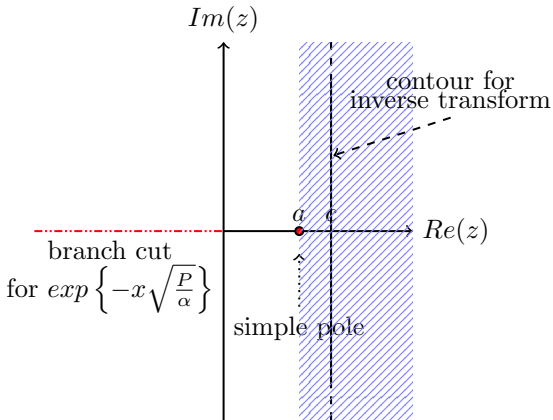
path of integration
(along the real axis)



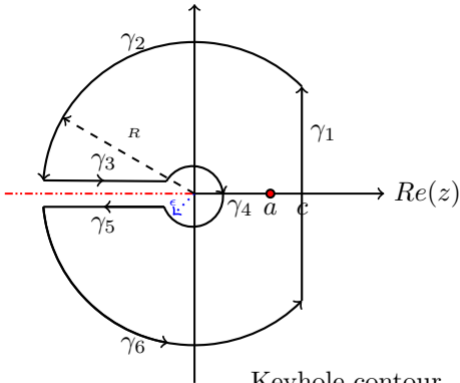
$Re(k)$

$-ia$ ← - - - simple pole





$Im(z)$



Keyhole contour

$$\Gamma = \bigcup_{i=1}^6 \gamma_i$$