Figures Calculus III

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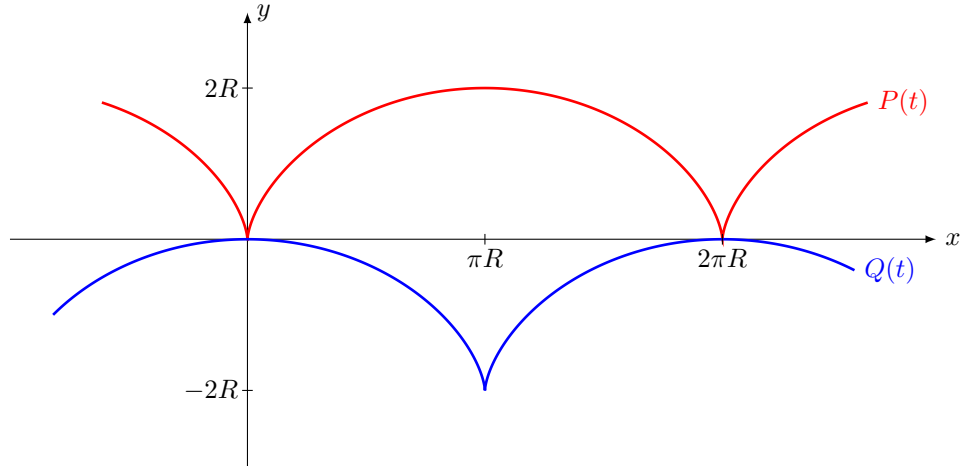
1.2.3 Example evolute cycloid

Figure 1: The cycloid $P(t) = [R(t - \sin t), R(1 - \cos t)]$ and its evolute $Q(t) = [R(t + \sin t), R(\cos t - 1)]$, which is a translation of $P(t)$.
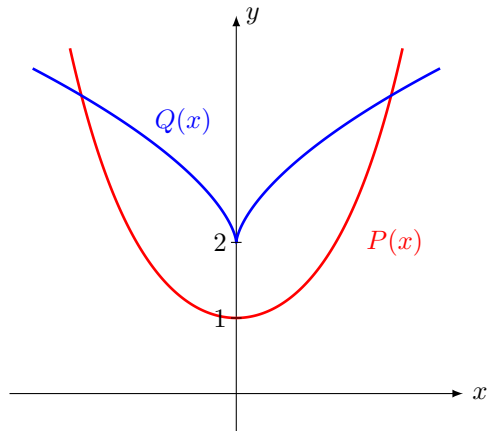
1.2.4 Example evolute catenary

Figure 2:
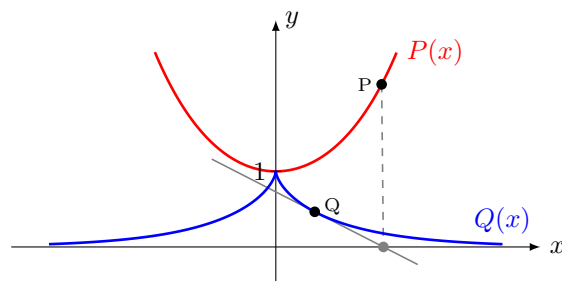
1.2.5 Example involute catenary (tractrix)

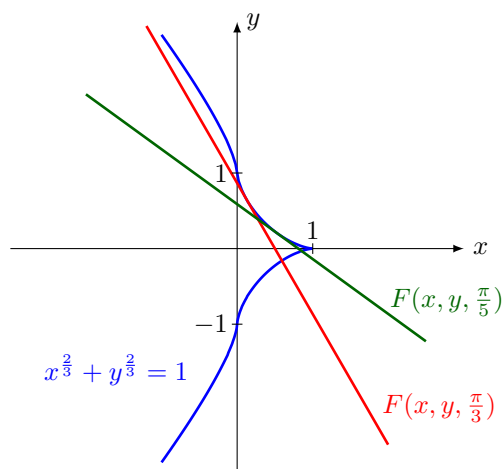Figure 3:

1.2.8 Example envelope family of straight lines
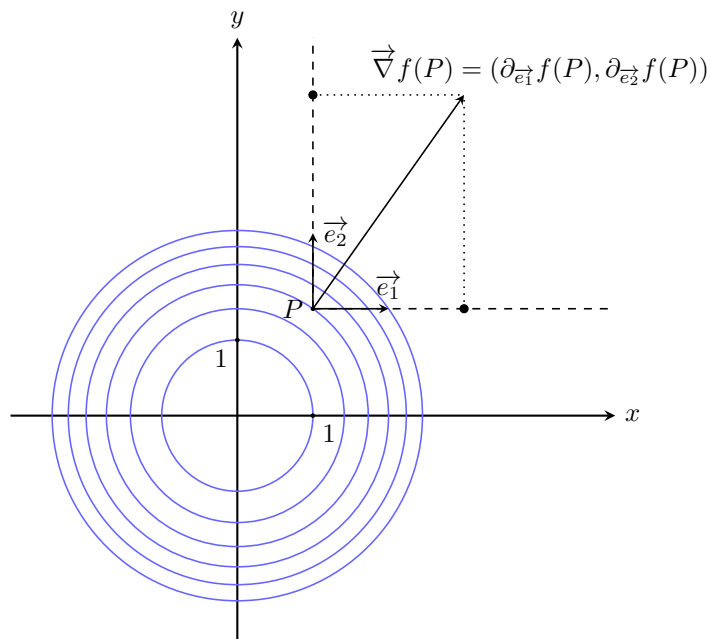

Figure 4:

2.3 Gradient of scalar field

Figure 5:

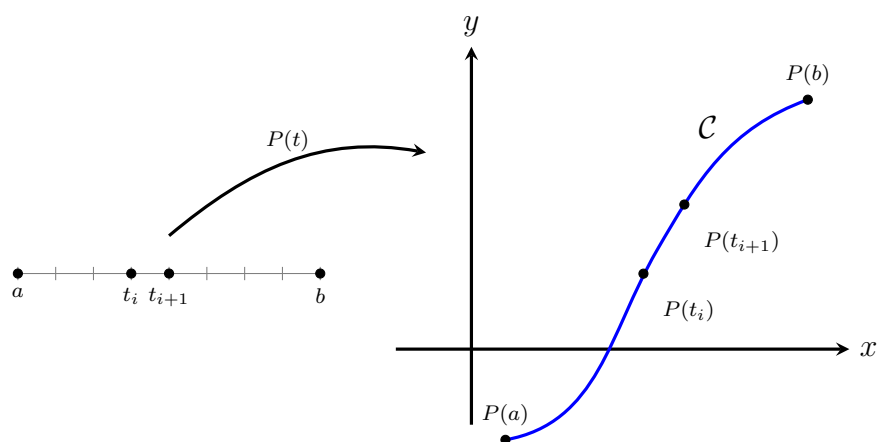## 3.1 Line integral of a scalar field

Figure 6:

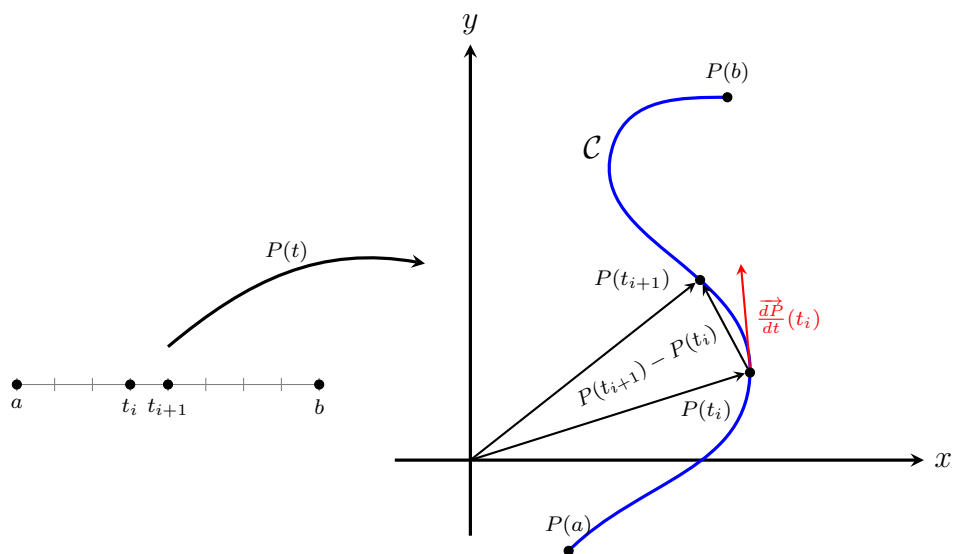## 3.2 Line integral of a vector field

Figure 7:
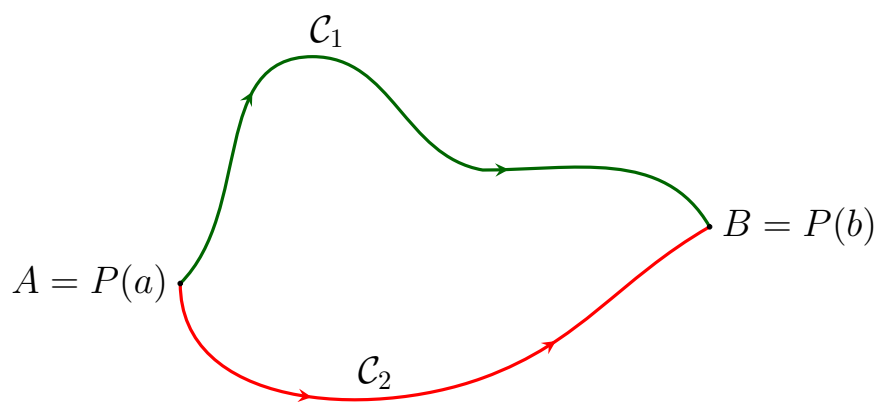
3.4.2 Conservative field along a curve

Figure 8:

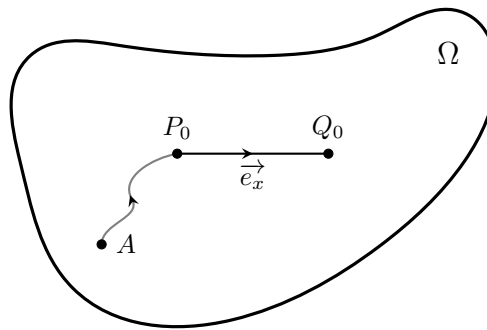### 3.4.3 Proof conservative field

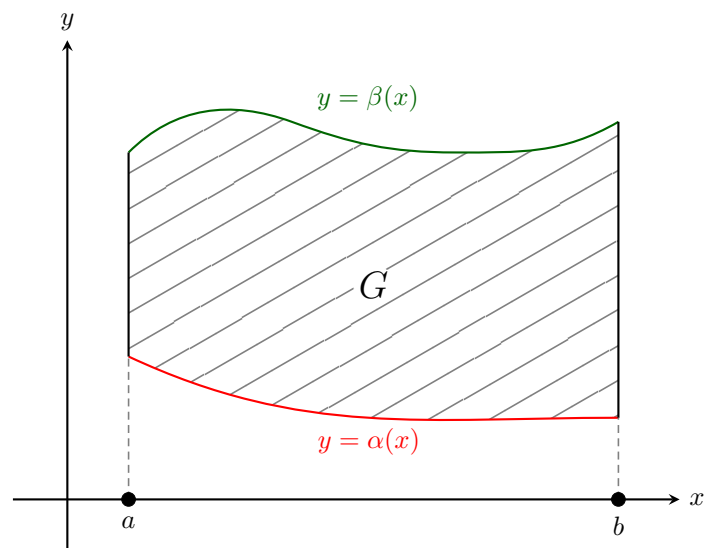Figure 9:

3.5.1 Proof Greens theorem

Figure 10:

3.5.2 Union of normal spaces

Figure 11:

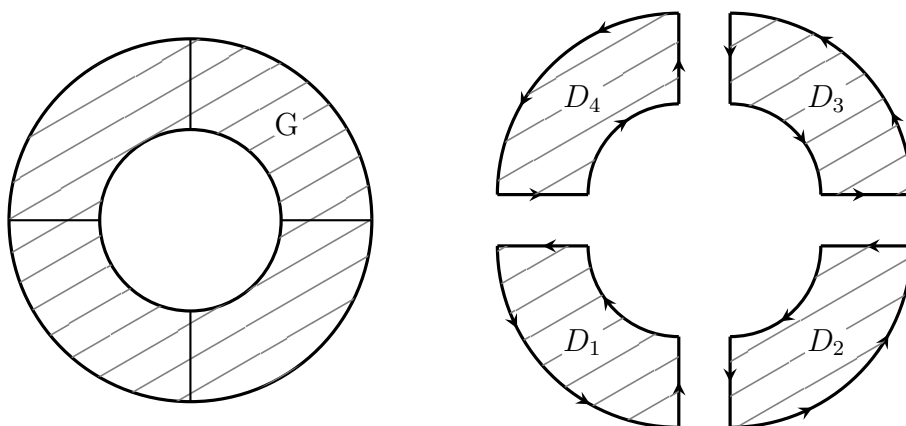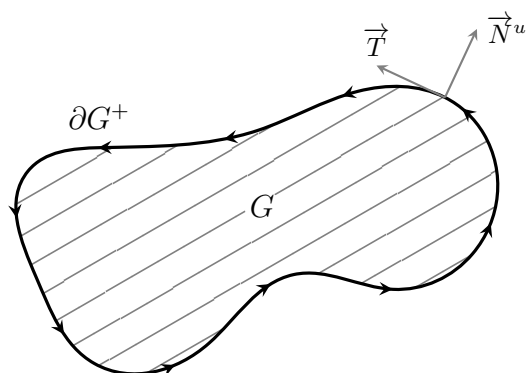## 3.5.4 Alternative formulation Greens theorem

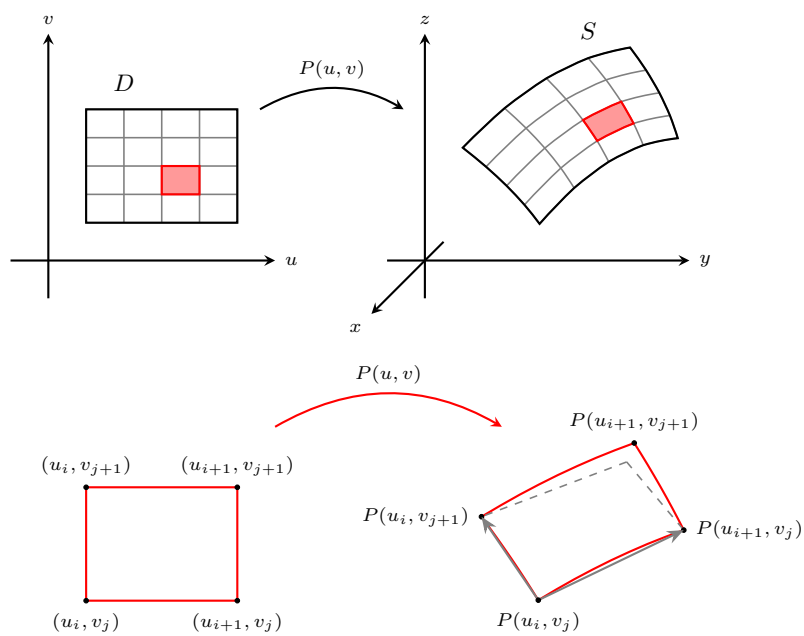Figure 12:

4.1 Surface integral of a scalar field

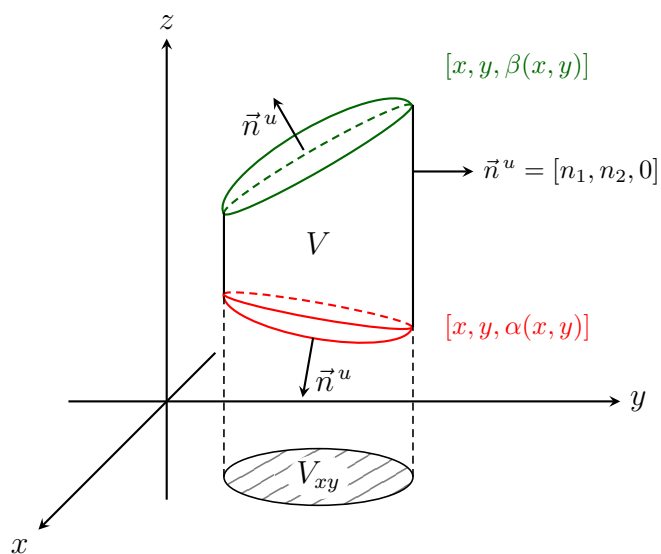Figure 13:

4.4.1 The divergence theorem

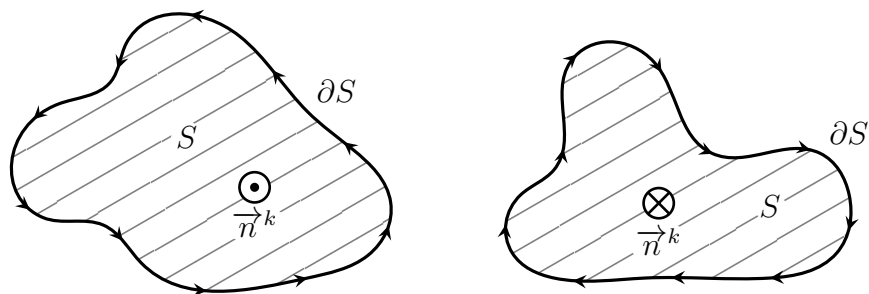Figure 14:

4.6.0 The corkscrew rule

Figure 15:

4.6.1 Stokes theorem
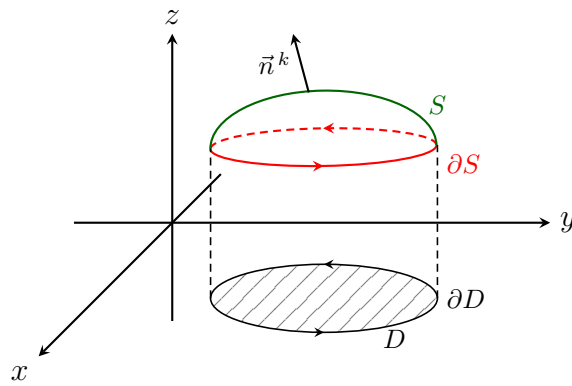
Figure 16:

5.1 Inverse function
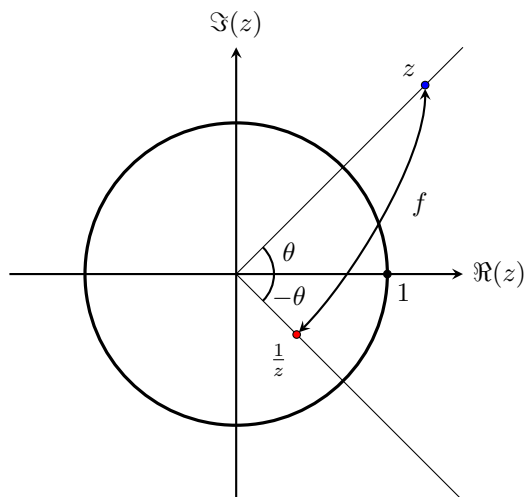
Figure 17:

5.1 Complex function

$\Im(z)$

$\Im(z)$

f

$z = x + iy$

$w = u + iv$
$= u(x, y) + iv(x, y)$

$\Re(z)$

$\Re(z)$

$\Omega \subset \mathbb{C}$
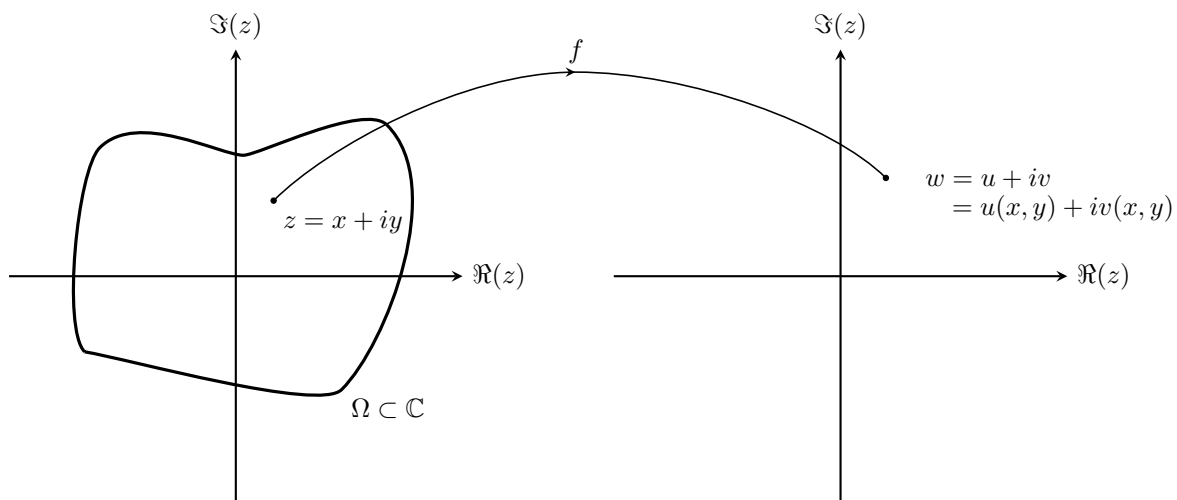
Figure 18:

5.2 Complex line integral

$\Im(z)$

$\gamma(b)$

γ

$\mathcal{C}$

$\Re(z)$

a t b

$\gamma'(t) \neq 0$

$\gamma(t)$

$\gamma(a)$
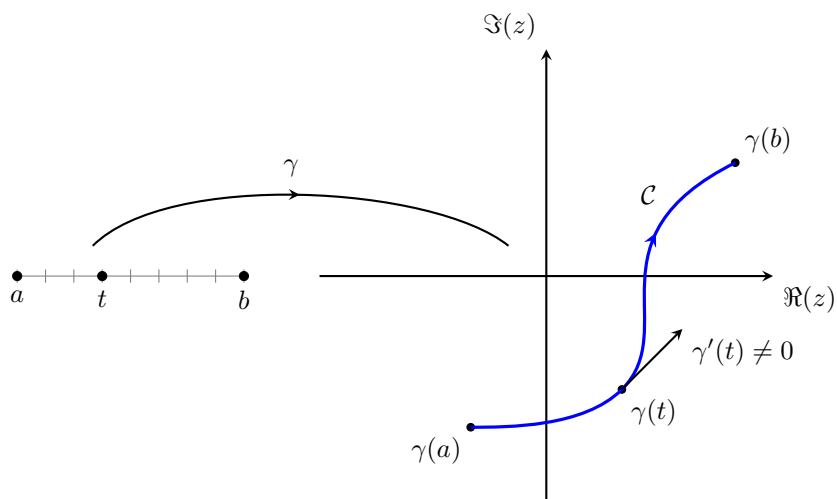
Figure 19:

6.2.1 Complex derivative

$$\Im(z)$$

$$\Omega$$

$$z = z_0 + ih$$

$$z_0$$

$$z = z_0 + h$$

$$\Re(z)$$
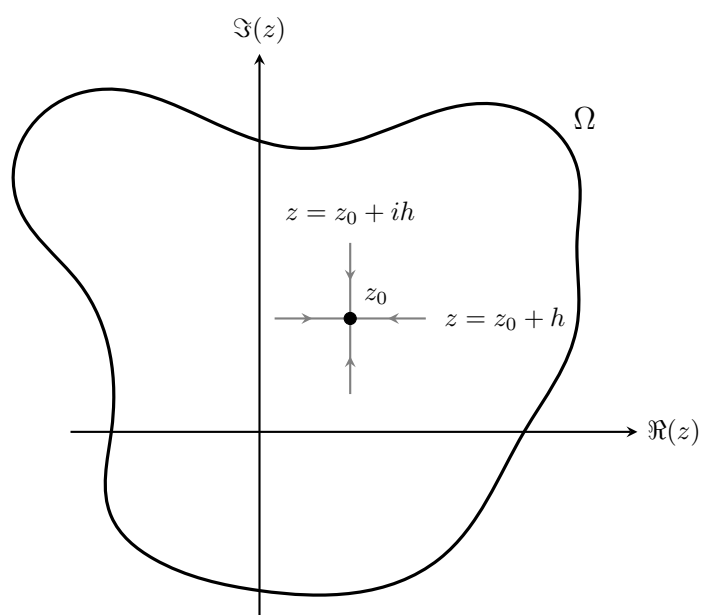
Figure 20:

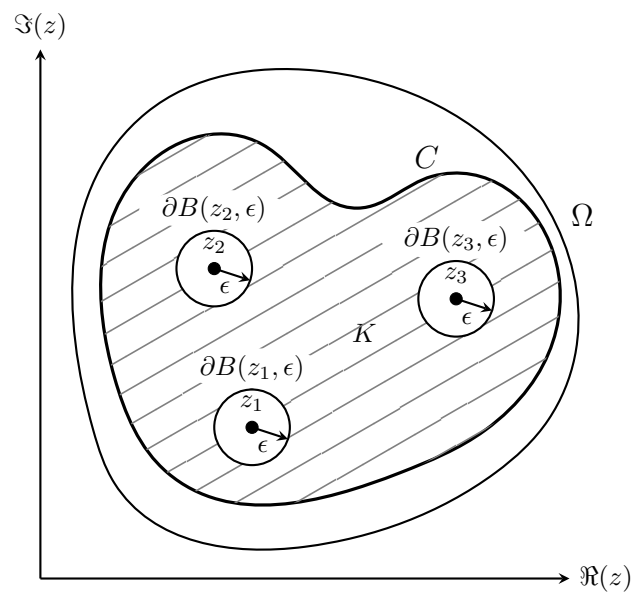## 6.3 Cauchy Goursat theorem for multiply connected domains

Figure 21:
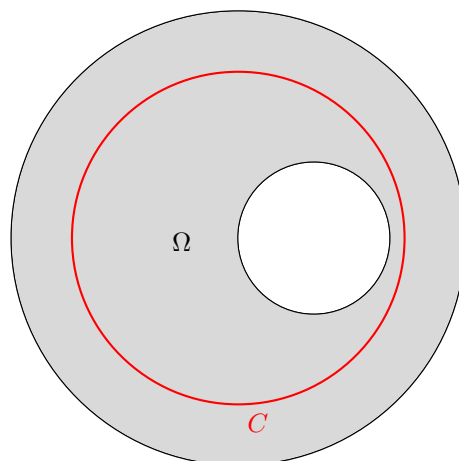
6.3 Contour non simply connected
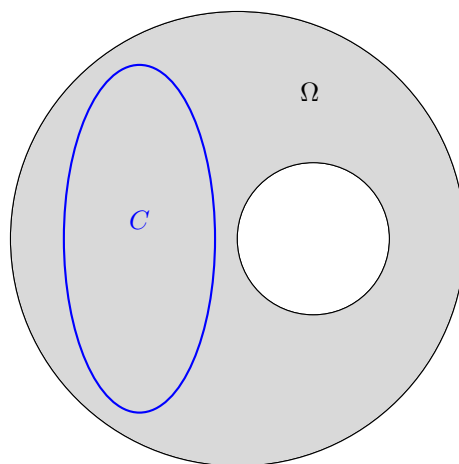

Figure 22:

6.3 Contour simply connected

Figure 23:

6.3.3 Proof integral formula Cauchy

Figure 24:

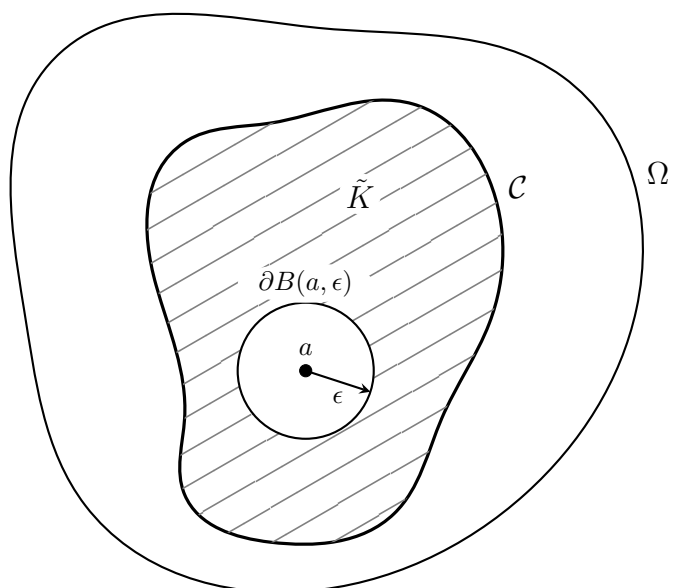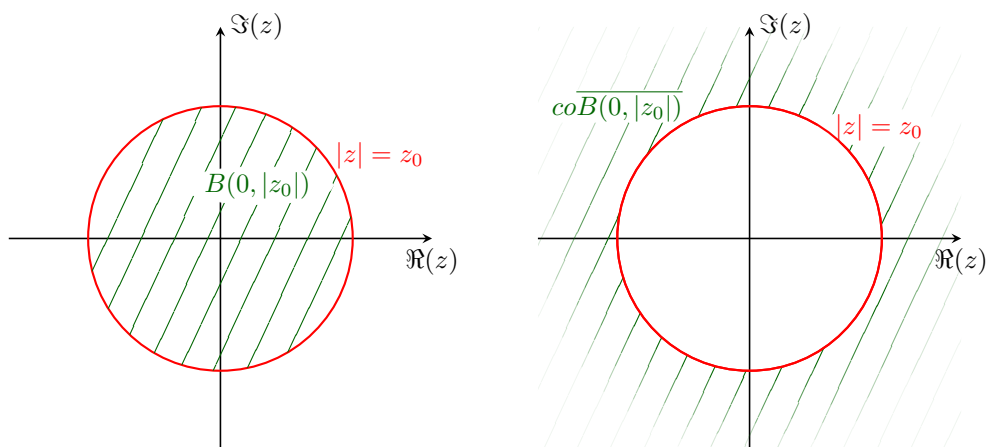## 7.2.4 Theorem convergence regions positive and negative power series

Figure 25:
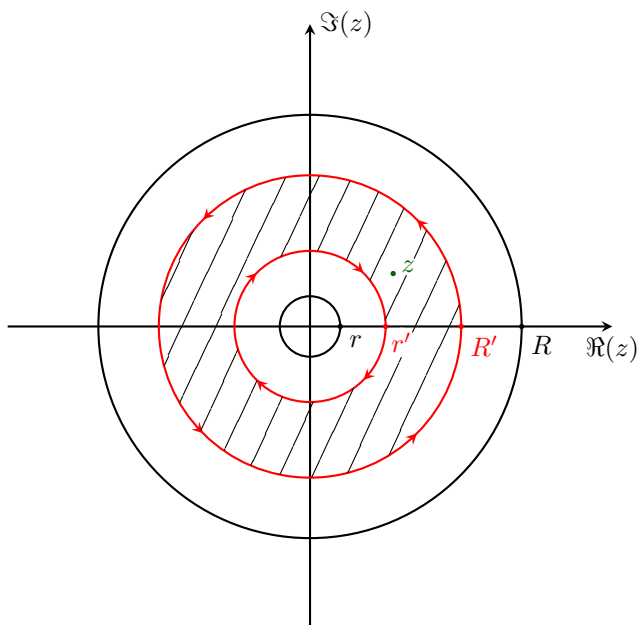
8.2.1 Proof theorem Laurent series

Figure 26:

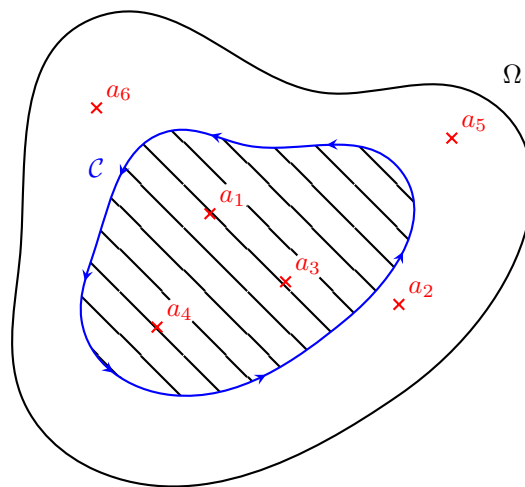## 8.5.6 Residue theorem for region with multiple singularities
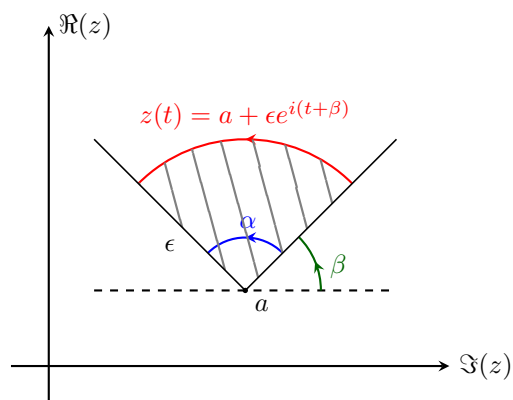

Figure 27:

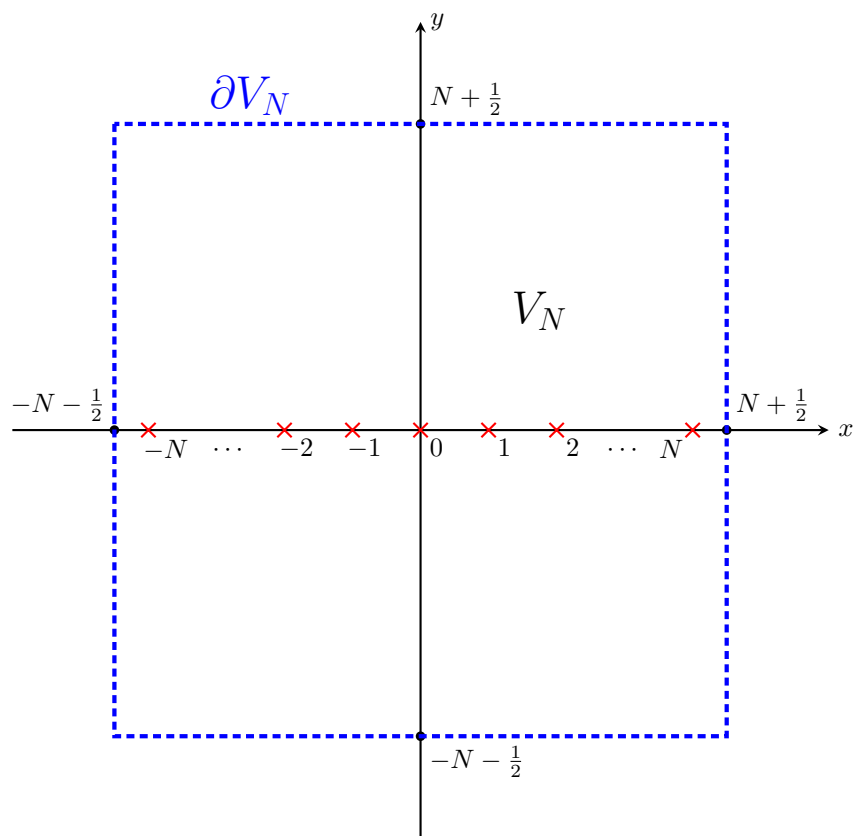## 9.3 Estimation lemmas

Figure 28:

9.5 Summation of series

Figure 29: