

Exercício 1.

1.1. $u = \frac{x+1}{(x+1)^2+y^2}, v = \frac{-y}{(x+1)^2+y^2}$

1.2. $u = 2x^2, v = 2x(y+1)$

1.3. $u = x^2 - y^2 - y, v = 2xy + x$

1.4. $u = \cos x \sin y / (\sin^2 x \cos^2 y + \cos^2 x \sin^2 y),$
 $v = -\sin x \cos y / (\sin^2 x \cos^2 y + \cos^2 x \sin^2 y)$

Exercício 2.

2.1. domínio \mathbb{C}

A função é contínua em $\mathbb{C} \setminus \{z = iy; y \in (0, \infty)\}$

2.2. domínio \mathbb{C}

A função é contínua em

$\mathbb{C} \setminus \{z = r(\cos \varphi + i \sin \varphi); \varphi = \pi/3, 2\pi/3, \pi\}$

2.3. $\mathbb{C} \setminus \mathbb{R}$

2.4. domínio \mathbb{C}

A função é contínua em $\mathbb{C} \setminus \{z = x; x \in (-\infty, 0)\}$

2.5. domínio \mathbb{C}

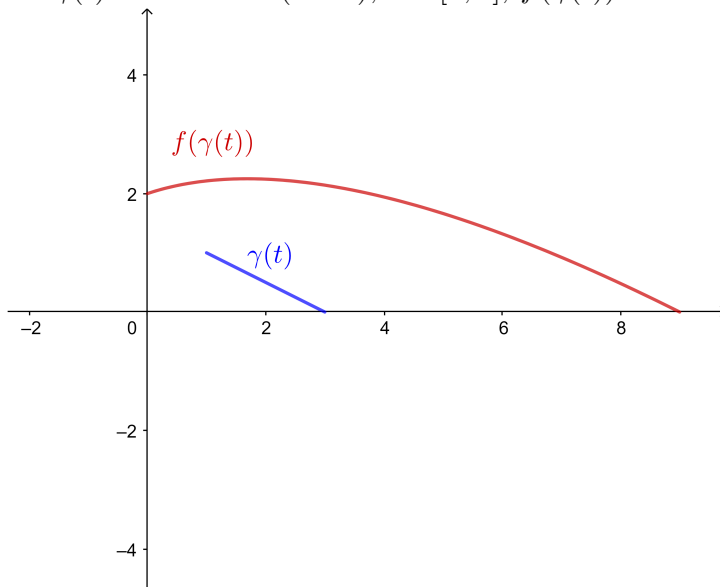
A função é contínua em

$\mathbb{C} \setminus \{z = x + i/2x; x^2 > 1/4x^2\}$

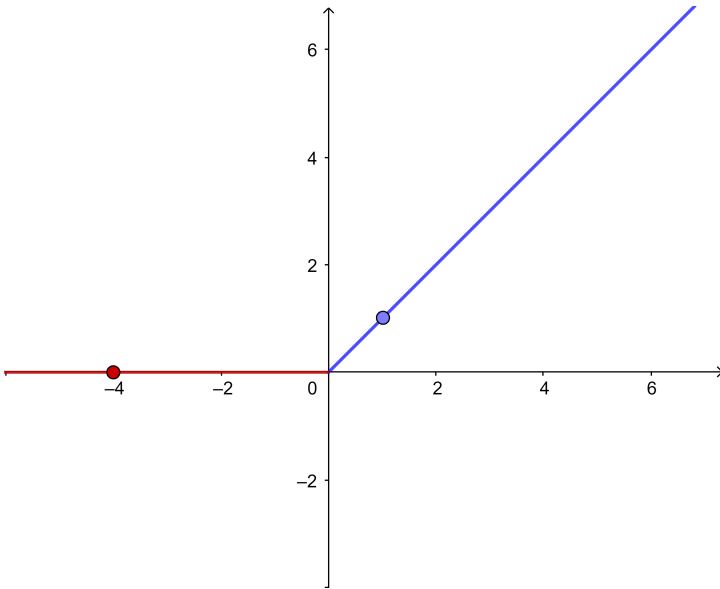
2.6. $\mathbb{C} \setminus \{(-1 \pm \sqrt{5})/2\}$

Exercício 3.

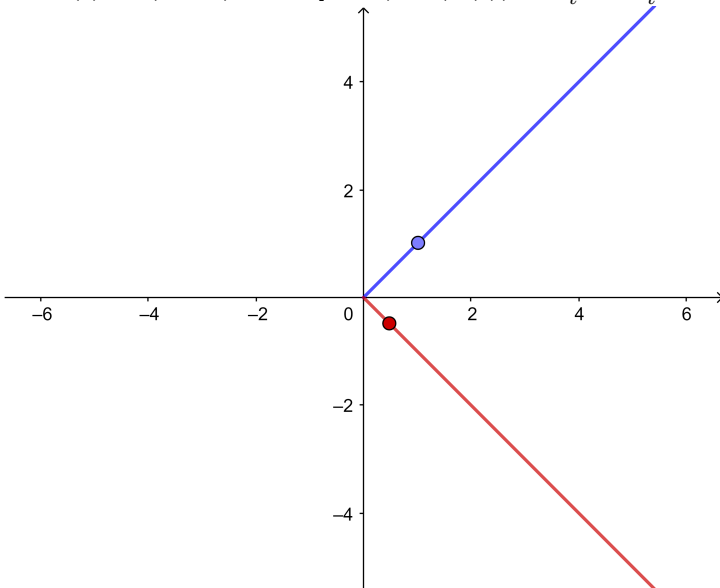
3.1. $\gamma(t) = 1 + 2t + i(1 - t), t \in [0, 1], f(\gamma(t)) = 3t^2 + 6t - 4it^2 + 2it + 2i$



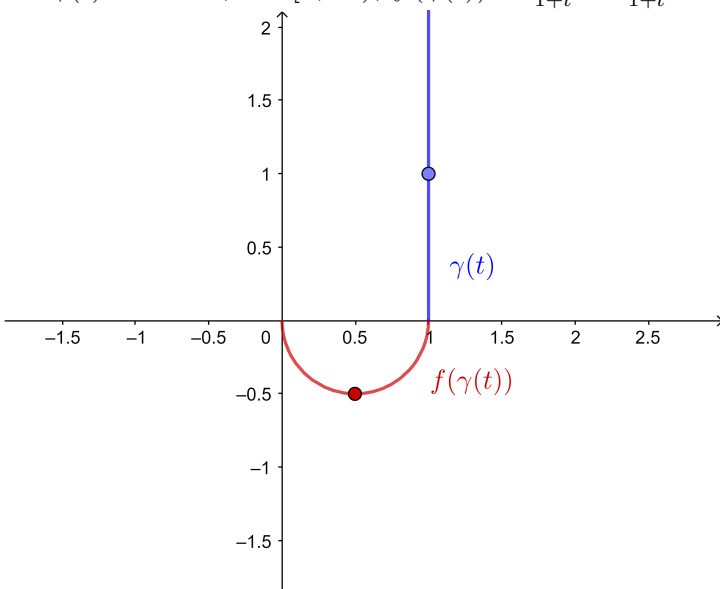
3.2. $\gamma(t) = (1 + i)t, t \in [0, \infty), f(\gamma(t)) = -4t^4$



3.3. $\gamma(t) = (1 + i)t, t \in [0, \infty), f(\gamma(t)) = \frac{0.5}{t} - \frac{0.5i}{t}$

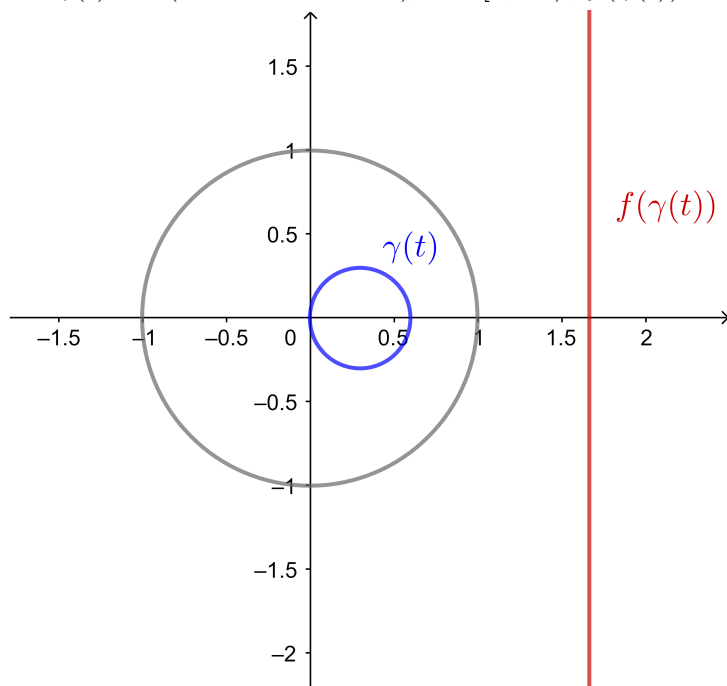


3.4. $\gamma(t) = 1 + it, t \in [0, \infty), f(\gamma(t)) = \frac{1}{1+t^2} - \frac{it}{1+t^2}$



3.5. $\gamma(t) = r(\cos t + i \sin t), t \in [0, 2\pi), f(\gamma(t)) = r^{-2}(\cos 2t - i \sin 2t)$

3.6. $\gamma(t) = r(1 + \cos t + i \sin t), t \in [0, 2\pi), f(\gamma(t)) = \frac{1}{2r} - \frac{1}{2r} \frac{i \sin t}{1 + \cos t}$



Exercício 4.

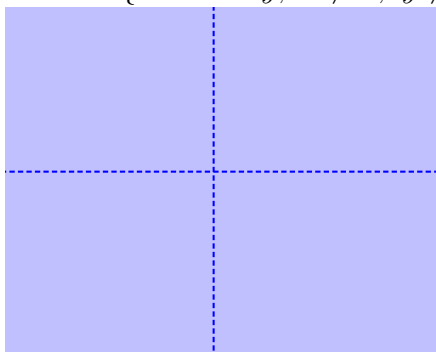
4.1. **

4.2. **

Exercício 5.

$$f(z) = \frac{y^2}{x^2} - \frac{x^2 - y^2}{y^2}i.$$

5.1. $D = \{z = x + iy; x \neq 0, y \neq 0\}$



5.2. Na fronteira.

5.3. **

5.4. Sim.

Exercício 6.

6.1. $|z| \neq 2$

6.2. $\mathbb{C} \setminus \{z = iy; y \neq 0\}$

6.3. \mathbb{C}

6.4. $\mathbb{C} \setminus \{z = iy; y \in (-\infty, 1) \cup (1, \infty)\}$

Exercício 7.

