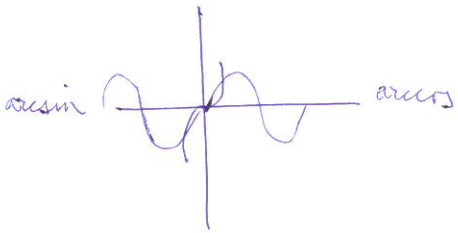
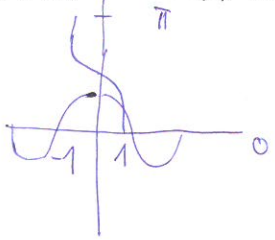
1C. Minipísemka z MB203

Určete definiční obor funkce f a zobrazte ho v rovině.

$$f(x,y) = \arccos(x) \cdot \ln(x \cdot \ln(x+y))$$





$x \in \langle -1;1 \rangle$

$x \cdot \ln(x+y) > 0$

$x > 0 \wedge \ln(x+y) > 0$

$x+y > 1$

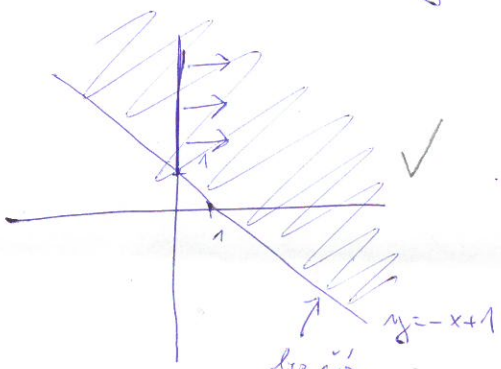
$y = -x+1$

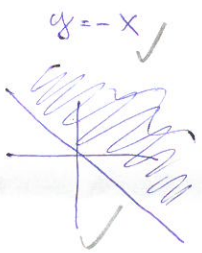
$x < 0 \wedge \ln(x+y) < 0$

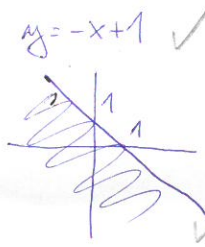
$x+y > 0 \wedge x+y < 1$

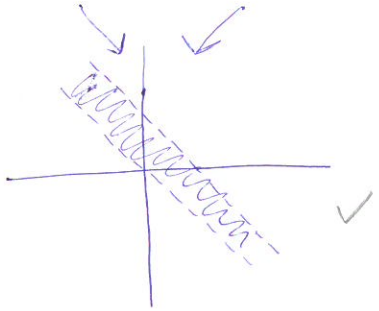
$y = -x$

$y = -x+1$

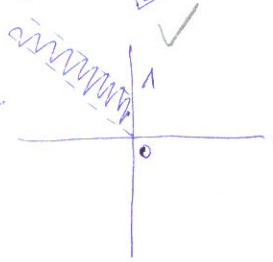


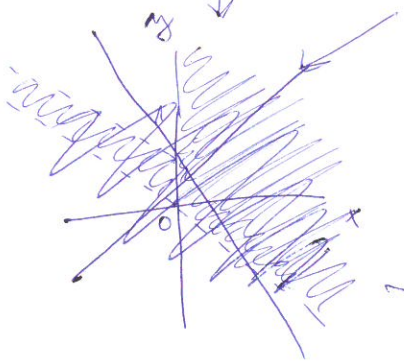




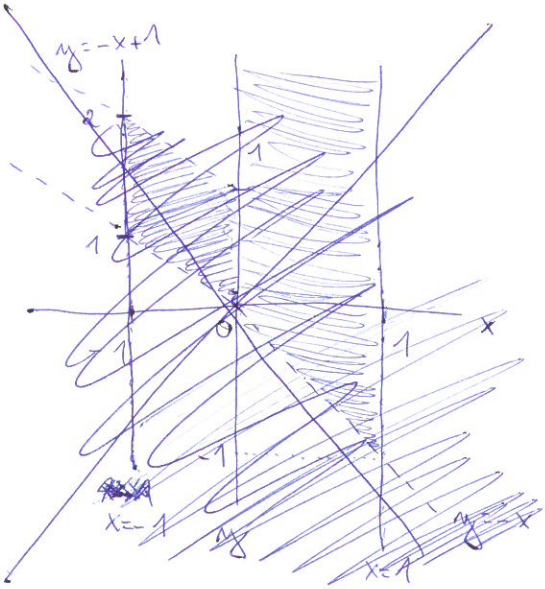


$x < 0$





$x \in \langle -1;1 \rangle$



$$D_f = \{(x,y) \in \mathbb{R}^2 \mid x \in \langle -1;1 \rangle \wedge ([x>0 \wedge \ln(x+y)>0] \vee [x<0 \wedge \ln(x+y)<0]) \wedge x+y>0\}$$

1D. Minipísemka z MB203

Určete definiční obor funkce f a zobrazte ho v rovině.

$$f(x,y) = \arccos(y) \cdot \ln(y \cdot \ln(x-y))$$

a) $\arccos(y) \rightarrow \boxed{y \in [-1,1]}$ ✓

b) $\ln(y \cdot \ln(x-y)) \rightarrow y \cdot \ln(x-y) > 0 \Rightarrow y \neq 0 \wedge \ln(x-y) \neq 0$

c) $\ln(x-y) \rightarrow x - y > 0 \Rightarrow \boxed{x > y}$ ✓

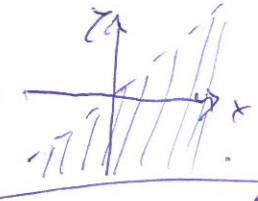
b) $y > 0 \wedge \ln(x-y) > 0 \quad \vee \quad y < 0 \wedge \ln(x-y) < 0$

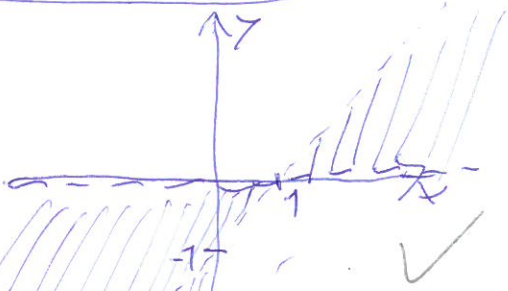
$y > 0 \wedge x - y > 1 \quad \vee \quad y < 0 \wedge x - y < 1$ ✓ ✓

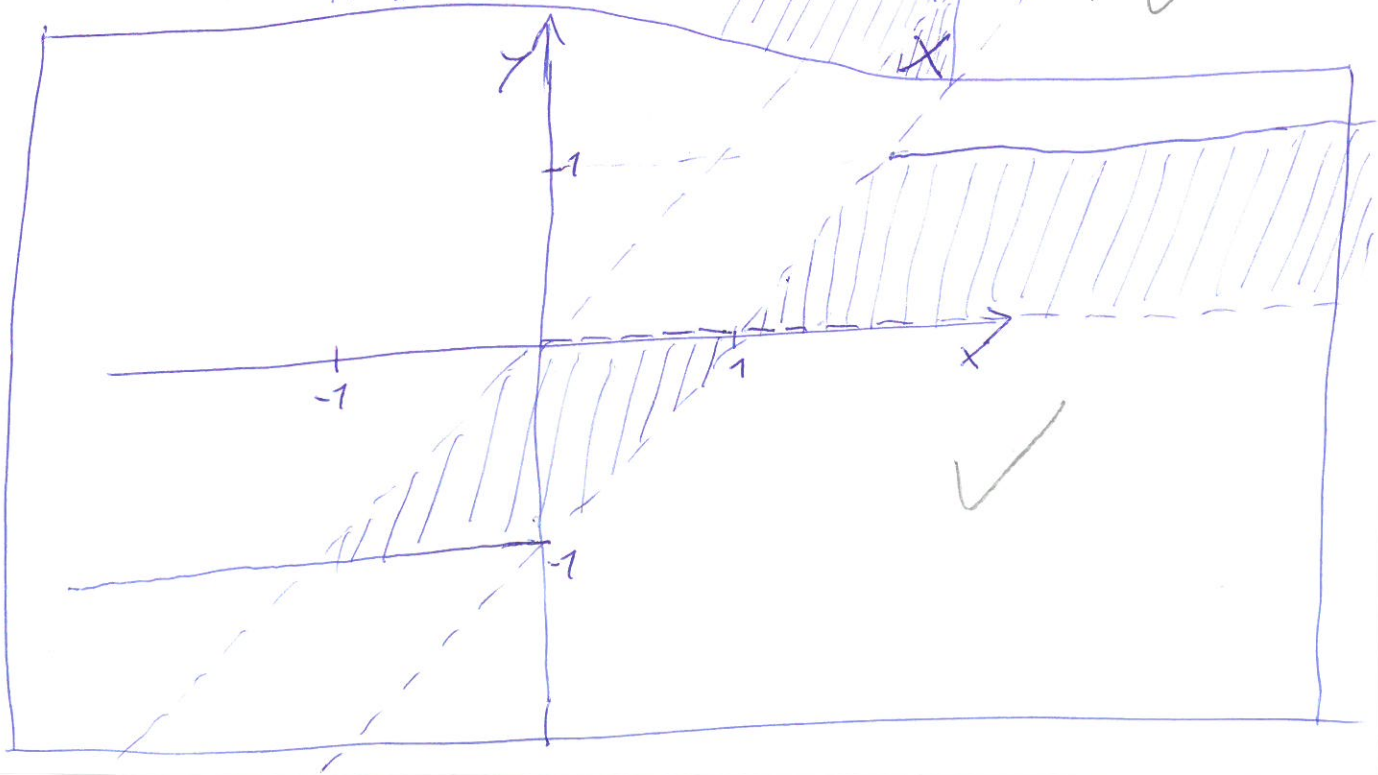
$\boxed{y > 0 \wedge y < x-1 \quad \vee \quad y < 0 \wedge y > x-1}$

$y \in (0; x-1) \cup (x-1; 0)$

a)  ✓

c)  ✓

b)  ✓



1A. Minipísemka z MB203

Určete definiční obor funkce f a zobrazte ho v rovině.

$$f(x,y) = \arcsin(y) \cdot \ln(x \cdot \ln(x+y))$$

$\mathcal{D}(\arcsin x) = \langle -1,1 \rangle \Rightarrow \quad y \in \langle -1,1 \rangle$ ✓

$\mathcal{D}(\ln x) = \mathbb{R}^+ \Rightarrow \quad x+y > 0$ ✓

$x \cdot (\ln(x+y)) > 0$

$+ \quad + \quad \Rightarrow x > 0 \wedge x+y > 1$

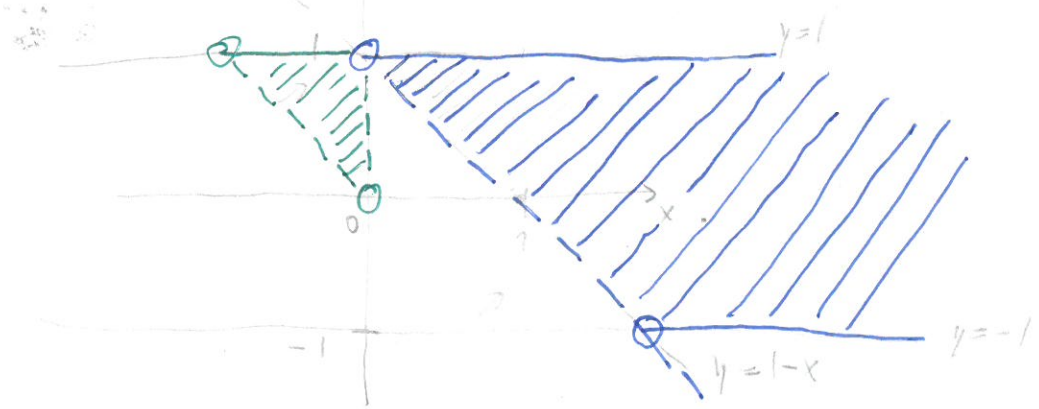
$- \quad - \quad \Rightarrow x < 0 \wedge 0 < x+y < 1$ ✓

$\mathcal{D}(f) = \{ (x,y) \in \mathbb{R}^2 \mid y \in [-1,1] \wedge ($

Ⅰ $(x > 0 \wedge x+y > 1) \vee$

Ⅱ $(x < 0 \wedge 0 < x+y < 1) \} \stackrel{!}{=}$ Ⅰ ∪ Ⅱ

$= \{ (x,y) \in \mathbb{R} \times [-1,1] \mid$
$(x > 0 \wedge x+y > 1) \vee$
$(x < 0 \wedge x+y > 0) \}$



✓

1b

1A. Minipísemka z MB203

Určete definiční obor funkce f a zobrazte ho v rovině.

$$f(x,y) = \arcsin(y) \cdot \ln(x \cdot \ln(x-y))$$

$\mathcal{D}(\arcsin) = [-1,1] \Rightarrow y \in [-1,1]$ ✓

$\mathcal{D}(\ln) = (0,\infty)$ ✓

$x - y > 0$

$-y > -x$

$y < x$ ✓

$x \cdot \ln(x-y) > 0$ ✓

Tj. $\oplus \cdot \oplus$

$x > 0 \wedge \ln(x-y) > 0$

$\Rightarrow x > 0 \wedge x - y > 1 \quad (\wedge x - y > 0)$ ✓

$-y > 1 - x$

$y < x - 1$ ✓

Nebo $\ominus \cdot \ominus$ ✓

$x < 0 \wedge \ln(x-y) < 0$

$\Rightarrow x < 0 \wedge x - y < 1 \quad (\wedge x - y > 0)$ ✓

$-y < 1 - x$

$y > x - 1$ ✓

Podmínky:

1. $y \in [-1,1]$ ✓
2. $y < x$ ✓
3. Buď
   a) $x > 0 \wedge y < x - 1$ ✓
   nebo
   b) $x < 0 \wedge y > x - 1$

$\mathcal{D}_f = \{(x,y) \in \mathbb{R}^2 \mid$ platí podmínky 1., 2., 3.$\}$ ✓