ZAKRESLETE DEFINIČNÍ OBOR FUNKCE:

1) $f(x,y) = \sqrt{4-x-y} + \log(y-x) + \sqrt{3x-3}$

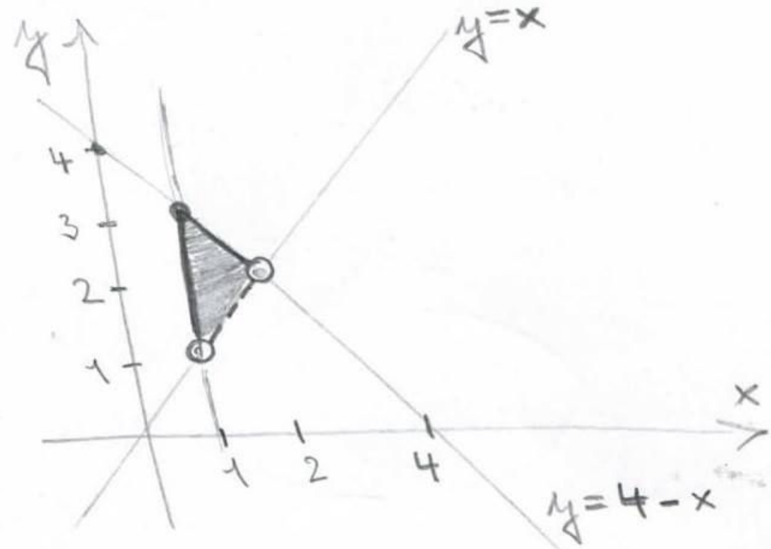
- $4-x-y \geq 0 \quad |+y$

  $\boxed{y \leq 4-x}$
- $y-x > 0$

  $\boxed{y > x}$
- $3x-3 \geq 0 \quad |:3$

  $x-1 \geq 0$

  $\boxed{x \geq 1}$

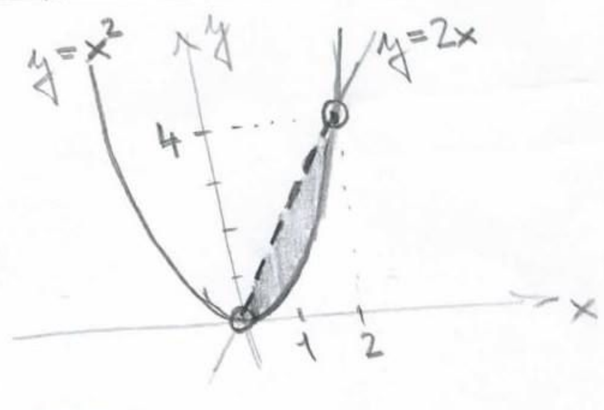


2) $f(x,y) = \sqrt{y-x^2} - \log_2(2x-y)$

- $y-x^2 \geq 0$

  $\boxed{y \geq x^2}$
- $2x-y > 0 \quad |+y$

  $\boxed{y < 2x}$



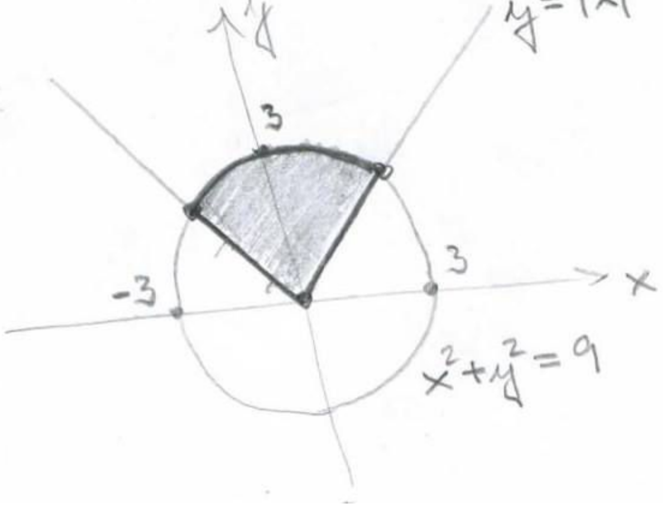
3) $f(x,y) = \sqrt{9-x^2-y^2} + \sqrt{y-|x|}$

- $9-x^2-y^2 \geq 0$

  $\boxed{x^2+y^2 \leq 9}$

  KRUH O POLOMĚRU 3
  SE STŘEDEM V [0;0]
- $y-|x| \geq 0$

  $\boxed{y \geq |x|}$



11) $f(x,y) = \sqrt{\sin x + y - 2} + \sqrt{2\sin x + 2 - y} + \log(\pi x - x^2)$

- $\pi x - x^2 > 0$

$x(\pi - x) > 0 \iff \boxed{x \in (0, \pi)}$

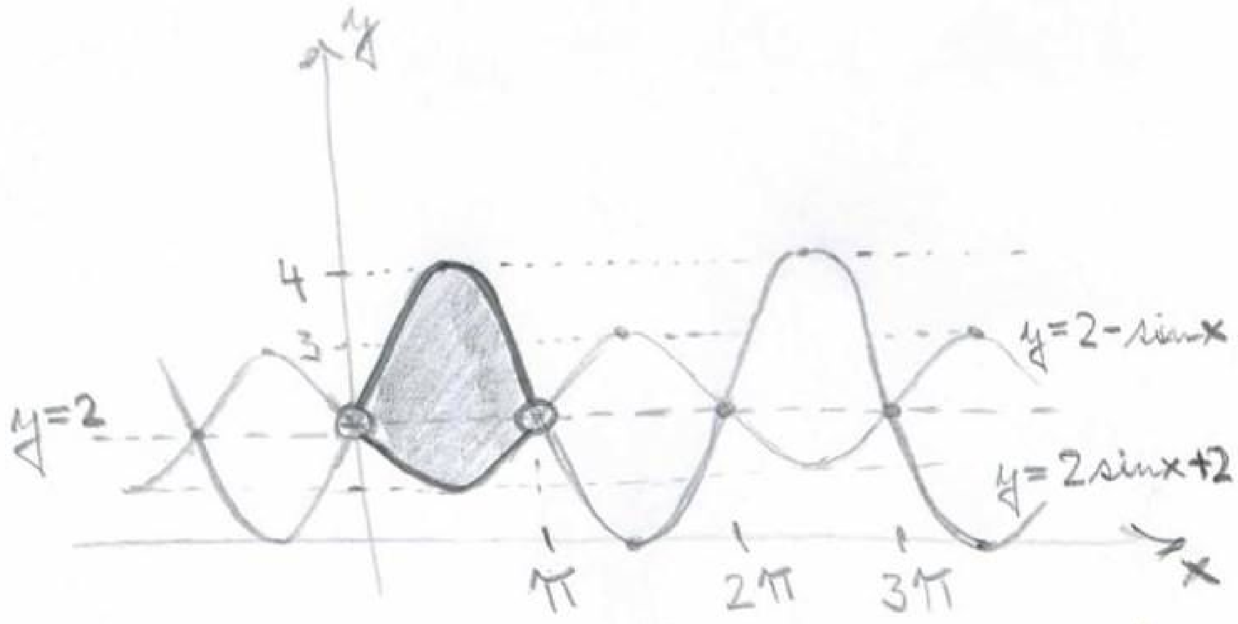
	$-\infty$	0		π	∞
x	$-$		$+$		$+$
$\pi - x$	$+$		$+$		$-$
	$-$		$+$		$-$

- $\sin x + y - 2 \geq 0$

$$\boxed{y \geq 2 - \sin x}$$

- $2\sin x + 2 - y \geq 0$

$$\boxed{y \leq 2\sin x + 2}$$



$$f(x,y) = \arcsin\left(x + \tfrac{1}{2}y\right) + \sqrt{5x - y} + \log(4 - x^2 - y^2)$$

- $-1 \le x + \frac{1}{2}y \le 1 \quad | -x$

  $-1 - x \le \frac{1}{2}y \le 1 - x \quad | \cdot 2$

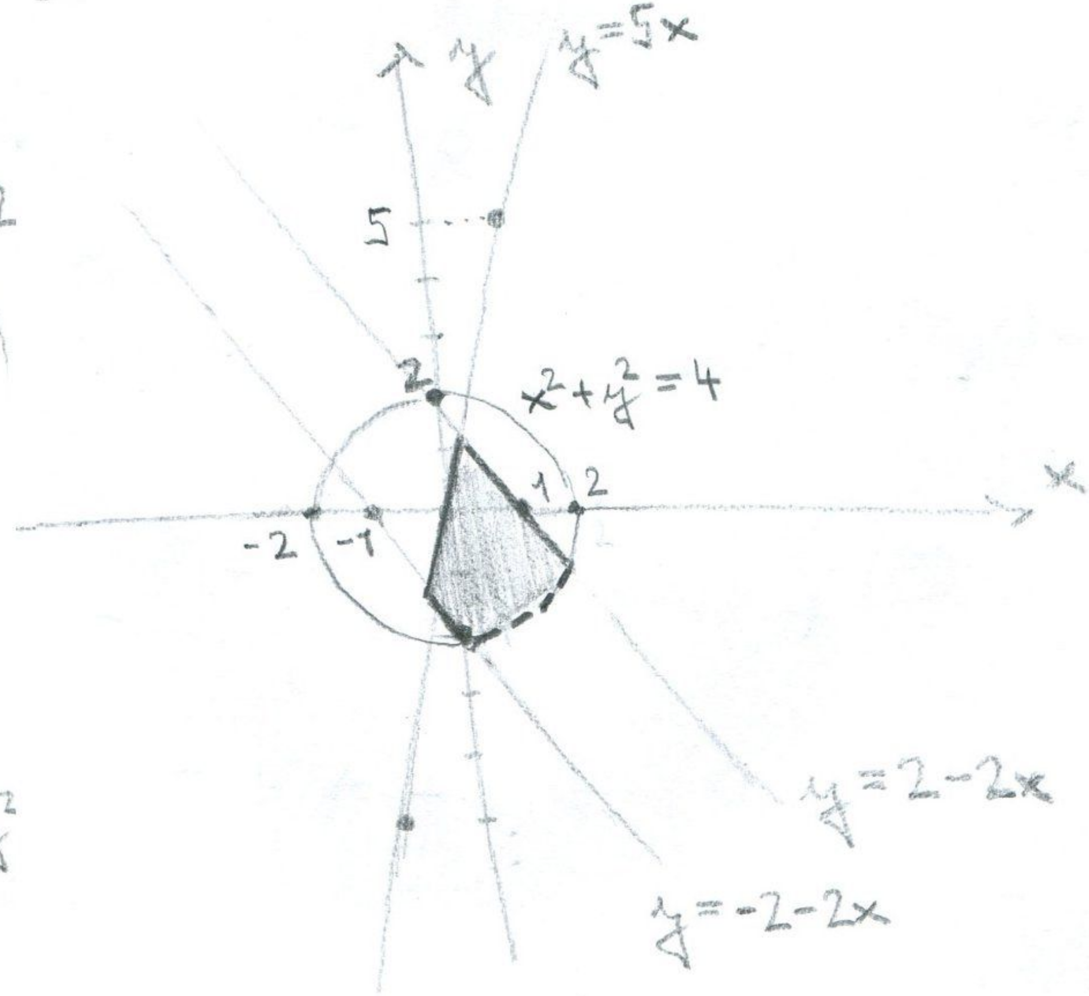
  $\boxed{-2 - 2x \le y \le 2 - 2x}$

- $5x - y \ge 0 \quad | + y$

  $\boxed{y \le 5x}$

- $4 - x^2 - y^2 > 0 \quad | + x^2 + y^2$

  $\boxed{x^2 + y^2 < 4}$



$$f(x,y) = \sqrt{36-4x^2-9y^2} + \log_6(x^2+y^2-4)$$

• $36 - 4x^2 - 9y^2 \geq 0$

$4x^2 + 9y^2 \leq 36 \quad |:36$

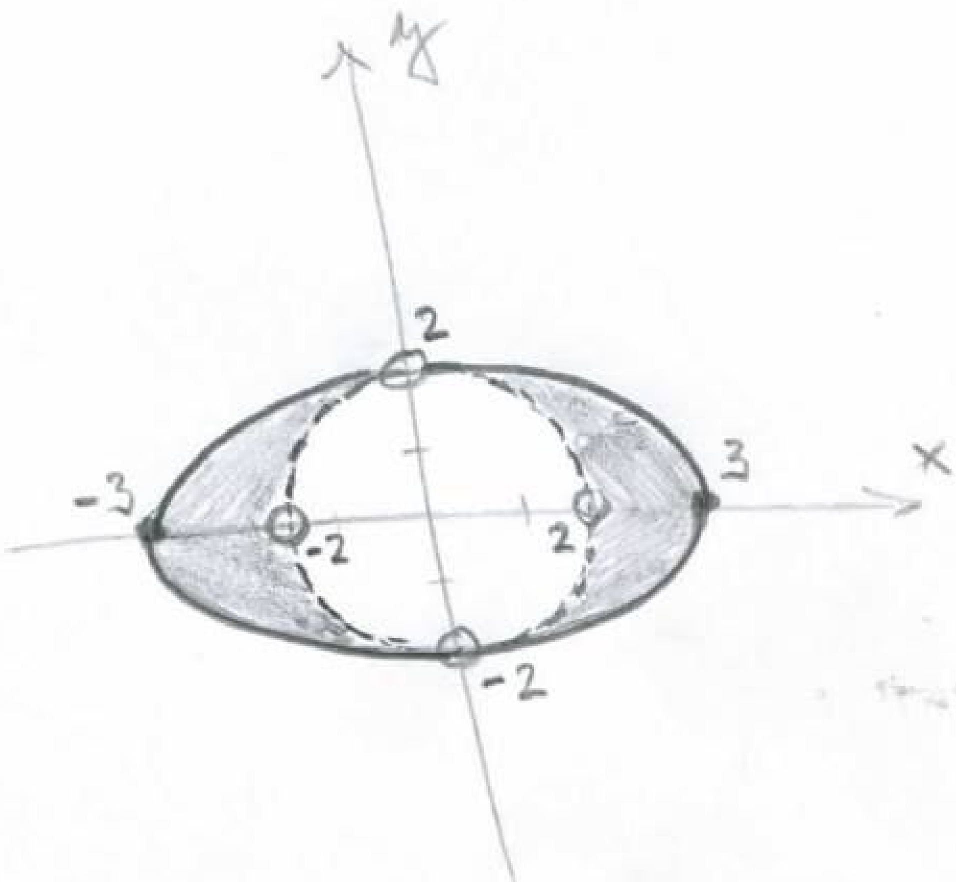
$$\boxed{\frac{x^2}{9} + \frac{y^2}{4} \leq 1}$$

ELIPSA SE STŘEDEM $[0,0]$
A DÉLKAMI POLOOS 3 A 2

• $x^2 + y^2 - 4 > 0$

$$\boxed{x^2 + y^2 > 4}$$

VNĚJŠÍ OBLAST KRUHU
O POLOMĚRU 2



$$f(x,y) = \log(y^2 - 4 + 4x) + \sqrt{4 - x - y^2}$$

- $y^2 - 4 + 4x > 0$

$4x > 4 - y^2 \quad | : 4$

$\boxed{x > 1 - \frac{1}{4}y^2}$

- $4 - x - y^2 \geq 0$

$\boxed{x \leq 4 - y^2}$

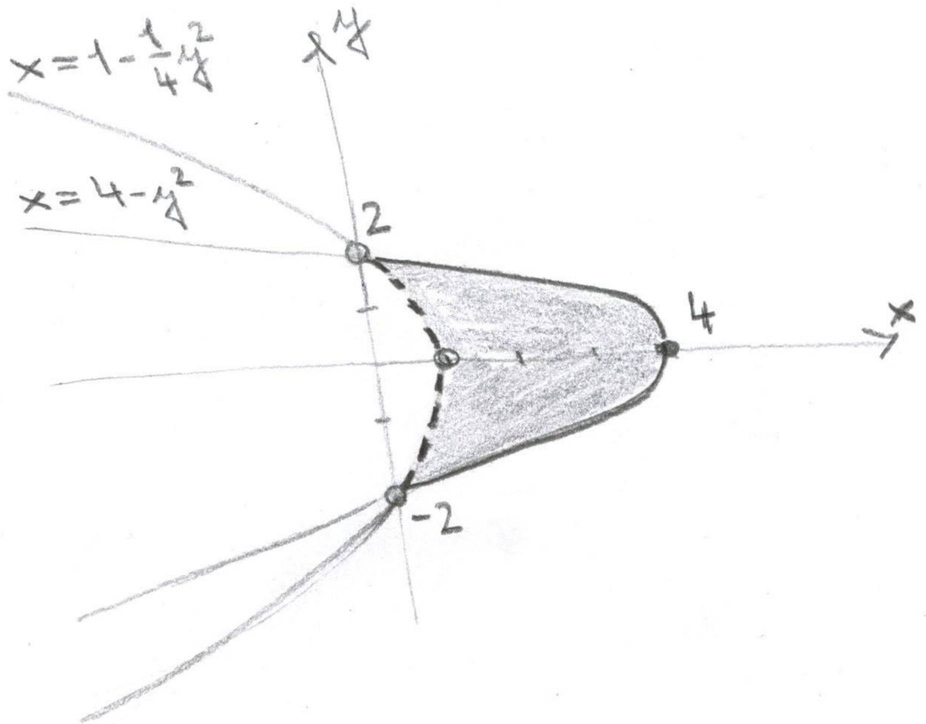
$$D_f = \{(x,y) \in \mathbb{R}^2 ; \ 1 - \frac{1}{4}y^2 < x \leq 4 - y^2\}$$

$x = 1 - \frac{1}{4}y^2$

x	1	0	0
y	0	2	-2

$x = 4 - y^2$

x	0	0	4
y	2	-2	0



$$f(x,y) = \sqrt{xy} + \frac{\sqrt{4-y-x^2}}{\log_{\frac{1}{2}}(y-2x-1)}$$

- $xy \geq 0 \iff ((x \geq 0) \wedge (y \geq 0)) \vee ((x \leq 0) \wedge (y \leq 0))$
- $4 - y - x^2 \geq 0 \iff \boxed{y \leq 4 - x^2}$
- $y - 2x - 1 > 0 \iff \boxed{y > 2x + 1}$
- $y - 2x - 1 \neq 2^0$

  $y - 2x - 1 \neq 1$

  $y \neq 2x + 2$

průsečíky přímky $y = 2x+1$

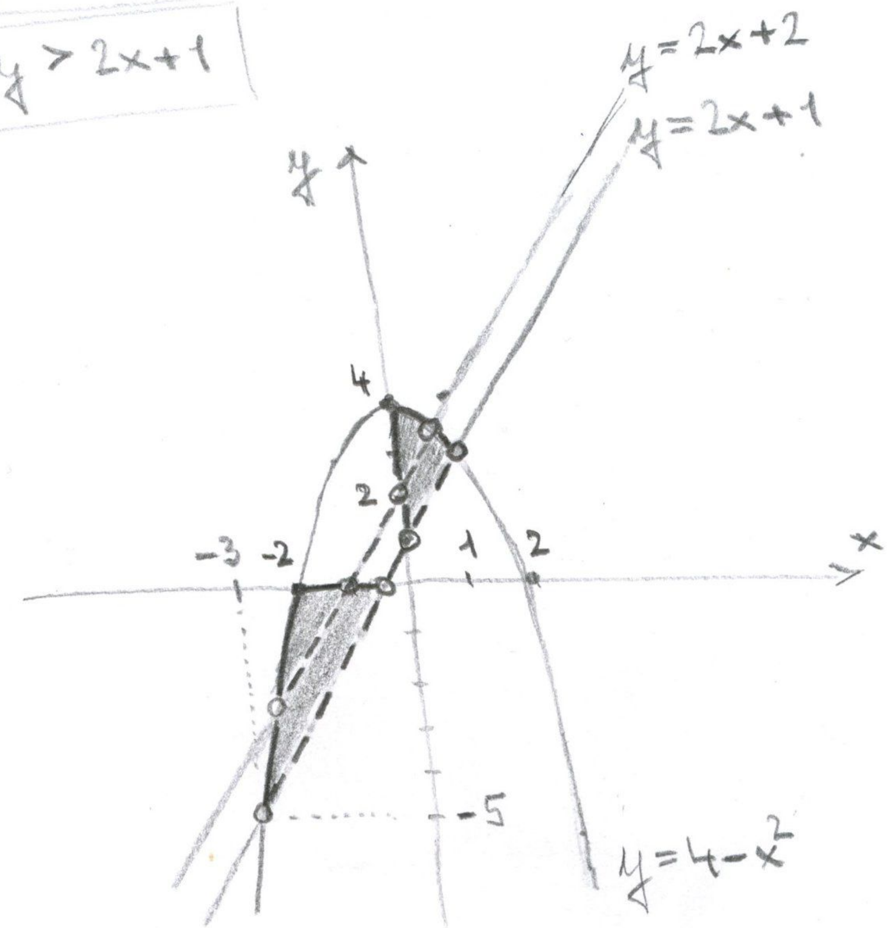
a paraboly $y = 4 - x^2$:

$2x + 1 = 4 - x^2$

$x^2 + 2x - 3 = 0$

$(x+3)(x-1) = 0$

$x = -3 \vee x = 1$



$$f(x,y) = \frac{\sqrt{y-x^2}}{\sin(x^2+y^2)} + \log(6-y) + \sqrt{2-x-x^2}$$

- $x^2 + y^2 \neq k\pi,\ k \in \mathbb{Z}$

kružnice se středem $[0;0]$
a poloměrem $\sqrt{k\pi}$

- $y - x^2 \geq 0 \iff y \geq x^2$
- $6 - y > 0 \iff y < 6$
- $2 - x - x^2 \geq 0 \quad |\cdot(-1)$

$x^2 + x - 2 \leq 0$

$(x-1)(x+2) \leq 0$

$x \in \langle -2, 1 \rangle$

	$(-\infty, -2)$	$(-2, 1)$	$(1, \infty)$
$x+2$	$-$	$+$	$+$
$x-1$	$-$	$-$	$+$
	$+$	$-$	$+$

$-\infty \quad + \quad -2 \quad - \quad 1 \quad + \quad \infty$