29.10.2025r.

Zadanie Zaznacz na płaszczyźnie zbiory:

a) $A = \{(x,y) \in \mathbb{R}^2 : y \geq x^2 + x\}$

$y = x^2 + x$

$x^2 + x = 0 \qquad \Delta = 1$

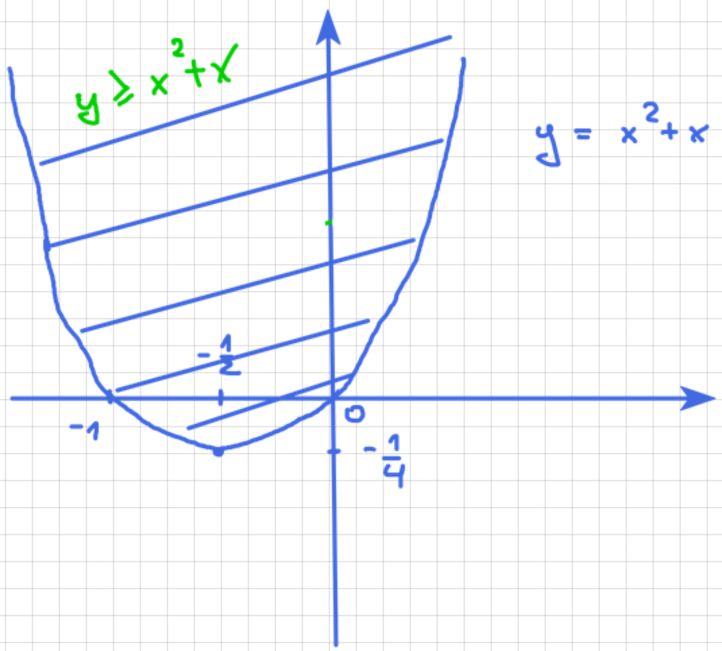
$x \cdot (x+1) = 0$

$x = 0 \quad \vee \quad x = -1$

$x_w = -\frac{b}{2a} = -\frac{1}{2}$

$y_w = -\frac{\Delta}{4a} \qquad y_w = -\frac{1}{4}$

$W = \left(-\frac{1}{2}, -\frac{1}{4}\right)$

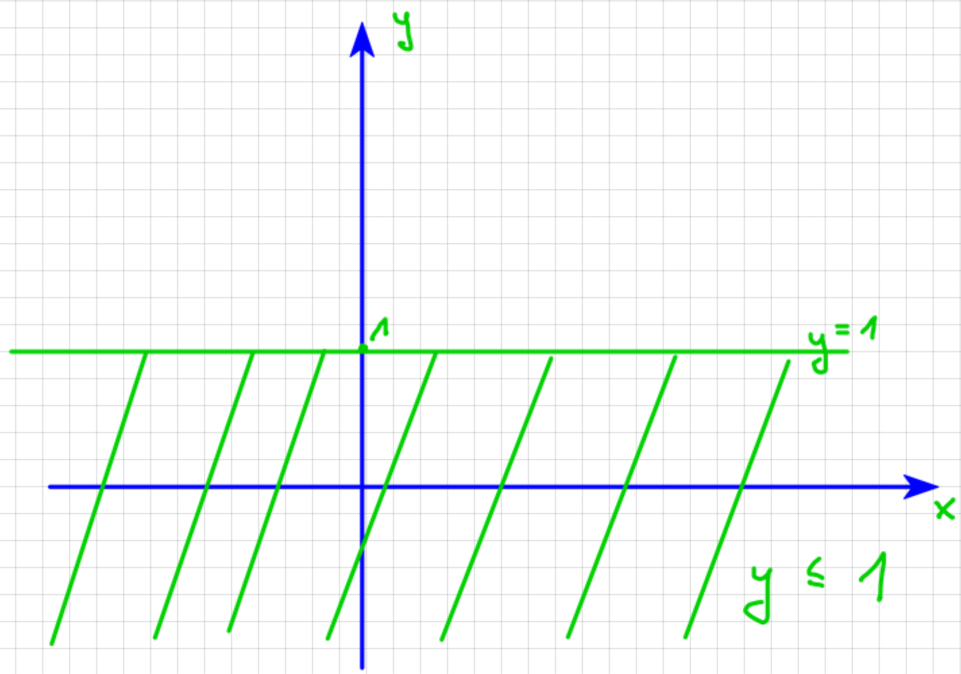


b) $B = \{(x,y) \in \mathbb{R}^2 : y - 1 \leq 0\}$

$y - 1 \leq 0$

$y \leq 1$

$y = 1$

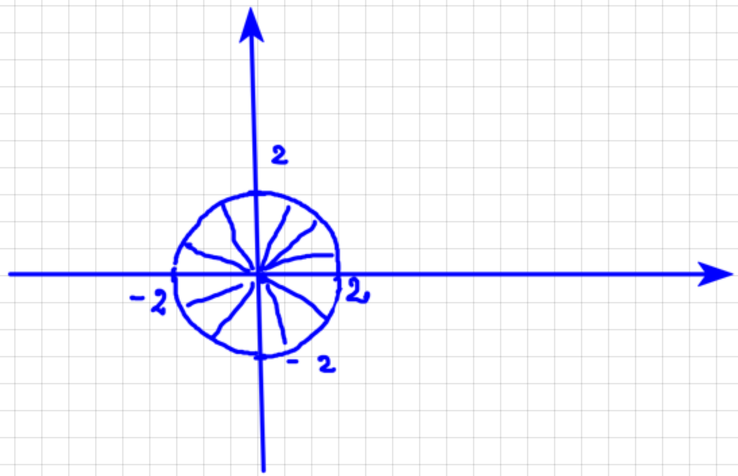


c) $A = \{(x,y) \in \mathbb{R}^2 : x^2 + y^2 \leq 4\}$

$(x-x_0)^2 + (y-y_0)^2 \leq r^2$

$x^2 + y^2 \leq 4$

Koło o środku w $S = (0,0)$ $\quad r = 2$



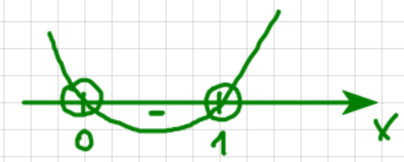
d) $B = \{(x,y) \in \mathbb{R}^2 : x^2 - x < 0\}$

$x^2 - x < 0$

$x(x-1) < 0$

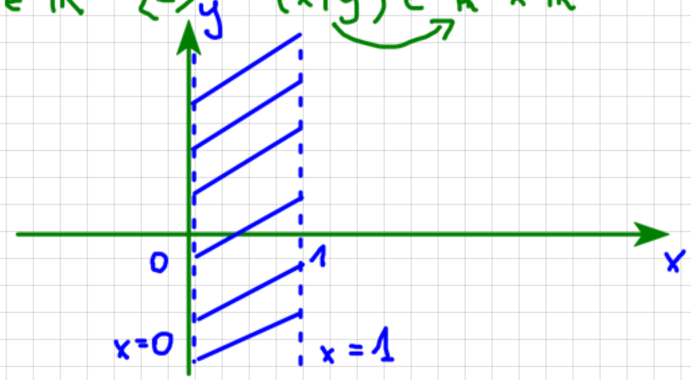
$x = 0 \quad \vee \quad x = 1$

$x \in (0,1)$



$B = \{(x,y) \in \mathbb{R}^2 : x \in (0,1)\}$

$(x,y) \in \mathbb{R}^2 \iff (x,y) \in \mathbb{R} \times \mathbb{R}$.



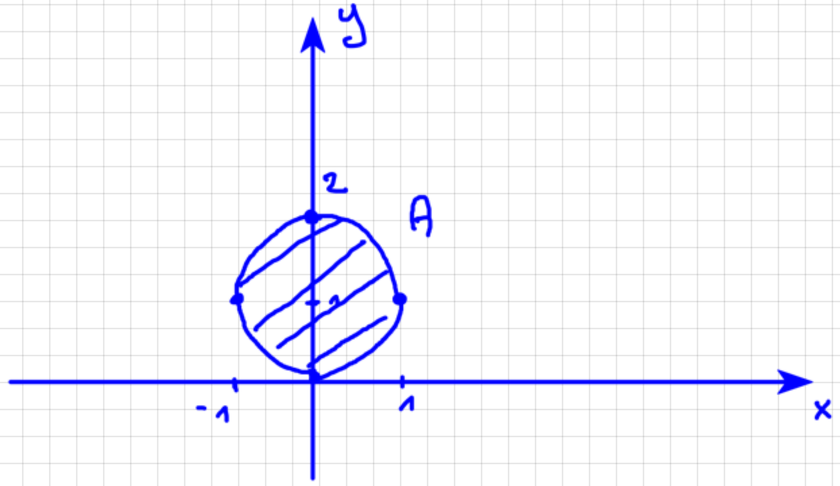
e) $A = \{(x,y) \in \mathbb{R}^2 : x^2 + y^2 - 2y \leq 0\}$

$$x^2 + \underbrace{y^2 - 2y} \leq 0$$

$$x^2 + \underbrace{(y-1)^2}_{y^2-2y+1} - 1 \leq 0$$

$$x^2 + (y-1)^2 \leq 1$$

Koło o środku w $S = (0,1)$ $r = 1$



Zadanie Naszkicuj zbiór $A \cap B$, gdy

a) $A = \{(x,y) \in \mathbb{R}^2 : x^2 + x + y \leq 0\}$

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

$y \leq -x^2 - x$

$y = -x^2 - x$

$-x^2 - x = 0 \quad \Delta = 1$

$-x(x+1) = 0$

$-x = 0 \quad \vee \quad x+1 = 0$

$x = 0 \quad \vee \quad x = -1$

$x_W = -\frac{b}{2a} = \frac{1}{-2} = -\frac{1}{2}$

$y_W = -\frac{\Delta}{4a} = -\frac{1}{-4} = \frac{1}{4}$

$W = (-\frac{1}{2}, \frac{1}{4})$

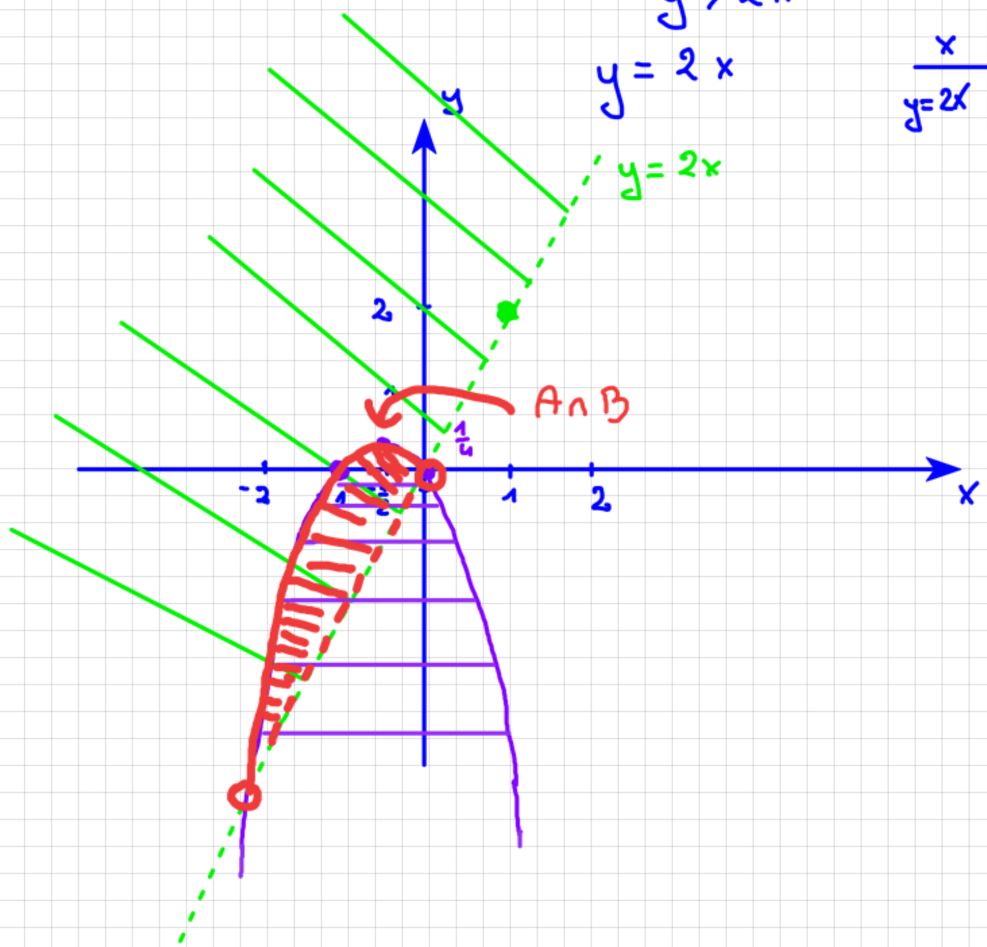
$B = \{(x,y) \in \mathbb{R}^2 : y - 2x > 0\}$

$y - 2x > 0$

$y > 2x$

$y = 2x$

x	0	1
$y=2x$	0	2



b) $A = \{(x,y) \in \mathbb{R}^2 : y \geq x^2 - 2x\}$

$B = \{(x,y) \in \mathbb{R}^2 : y + 1 < 0\}$

Naszkicuj $A \cap B$.

A: $y \geq x^2 - 2x$

$y = x^2 - 2x$

$x^2 - 2x = 0 \quad \Delta = 4$

$x(x-2) = 0$

$x = 0 \vee x = 2$

$x_w = -\frac{b}{2a} = \frac{2}{2} = 1$

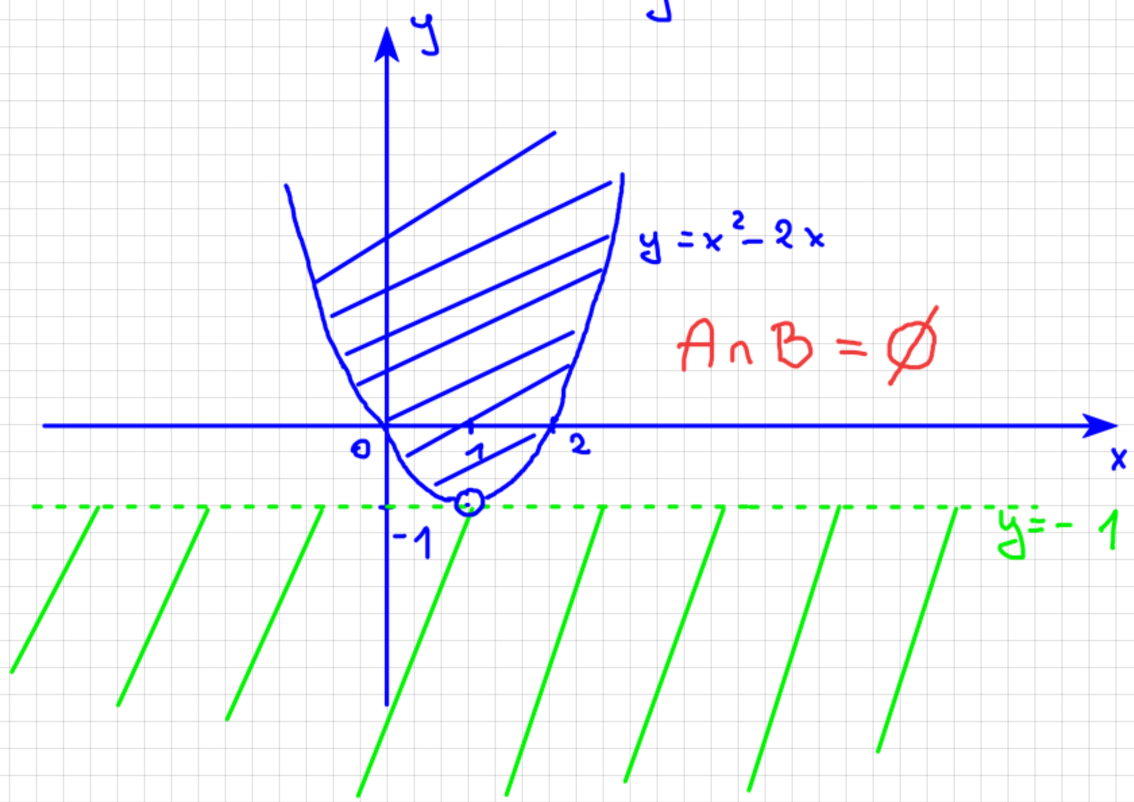
$y_w = -\frac{\Delta}{4a} = -\frac{4}{4} = -1$

$W = (1, -1)$

B: $y + 1 < 0$

$y < -1$

$y = -1$



$A \cap B = \emptyset$

c) $A = \{(x,y) \in \mathbb{R}^2 : |x| \geq y\}$

$B = \{(x,y) \in \mathbb{R}^2 : y \leq 3\}$

$|x| \geq y$

$y \leq |x|$

$y \leq 3$

$y = 3$

$y = |x|$