

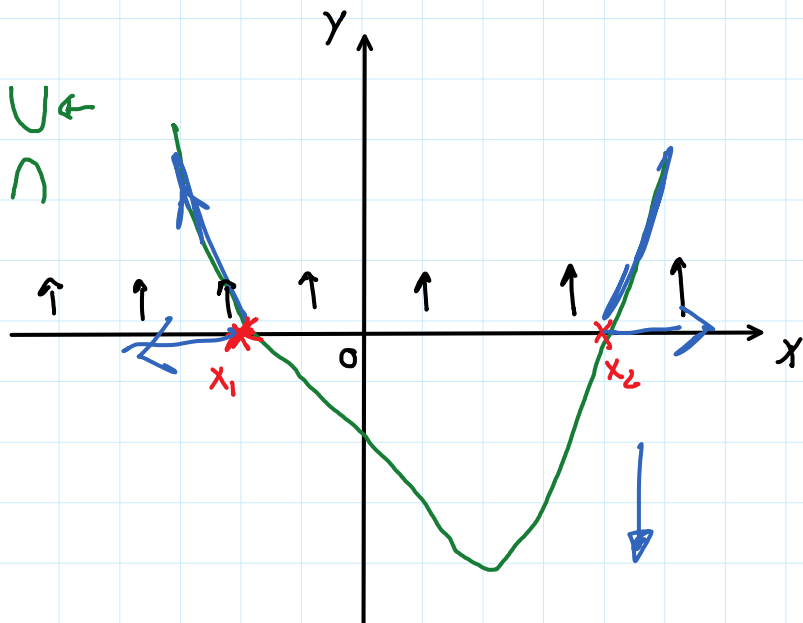
Kvadratické nerovnice

Při řešení využíváme znalosti kvadratických rovnic a kvadratických funkcí

$$ax^2 + bx + c > 0$$

$$a, b, c \in \mathbb{R} \wedge a \neq 0$$

$a > 0 \quad \cup \leftarrow$
 $a < 0 \quad \cap$



Kvadratická fce > 0

1) Řešíme kvadr. rovnici

Nulové body: $\rightarrow x_1, x_2$

$$ax^2 + bx + c = 0$$

$(-\infty, x_1) \cup (x_2, \infty)$

2) Kvadratické fce

Příklad:

$$x^2 - 5x - 6 \leq 0$$

$$\rightarrow (x-6) \cdot (x+1) \leq 0$$

Nulové body: 6; -1

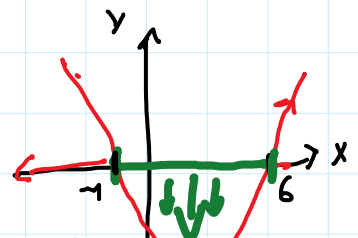
$(-\infty, -1) \cup (-1, 6)$ $[6, \infty)$

$(x-6)$ - - +

$(x+1)$ - + +

$(x+1) \cdot (x-6)$ + - +

$$\begin{aligned} \oplus x^2 - 5x - 6 &= 0 && \cup \\ (x-6) \cdot (x+1) &= 0 \\ \downarrow & \quad \downarrow \\ x_1 = 6 & \quad x_2 = -1 \end{aligned}$$



$K = \underline{\underline{(-1; 6)}}$

Vyřešte následující nerovnice:

a) $x^2 - 8 \geq -4$

b) $-2x^2 + 3x \leq 0$

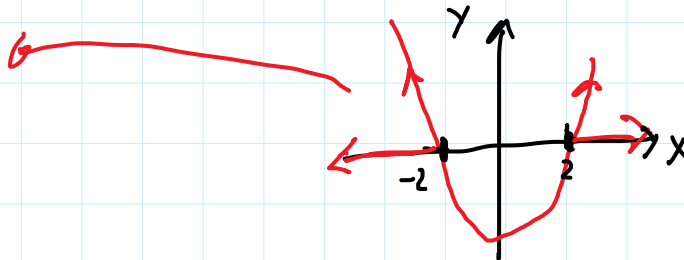
c) $3x^2 - 4x > 4$

$x^2 - 8 \geq -4 \quad / +4$

$x^2 - 4 \geq 0$

$K = (-\infty, -2) \cup (2, \infty)$

$x^2 - 4 = 0$
 $x^2 = 4$
 $x = \pm \sqrt{4}$
 $x_1 = -2$
 $x_2 = 2$



$-2x^2 + 3x \leq 0$

$x(-2x + 3) \leq 0$

$(-\infty; 0)$ $(0; \frac{3}{2})$ $(\frac{3}{2}; \infty)$

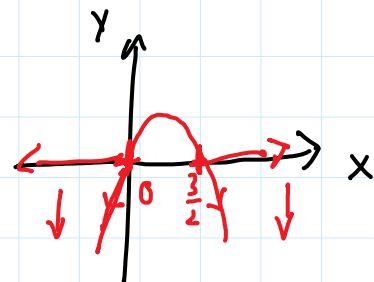
x $-$ $+$ $+$

$(-2x+3)$ $+$ $+$ $-$

$x \cdot (-2x+3)$ $(-)$ $+$ $(-)$

$-2x^2 + 3x = 0$
 $x \cdot (-2x + 3) = 0$

$x_1 = 0$
 $-2x = -3$
 $x_2 = \frac{-3}{-2} = \frac{3}{2}$



$K = (-\infty; 0) \cup (\frac{3}{2}; \infty)$

$$\vee 3x^2 - 4x > 4$$

$$3x^2 - 4x - 4 > 0$$

$$(-\infty, -\frac{2}{3}) \cup (2, \infty)$$

$$\left[\begin{array}{l} 3x^2 - 4x - 4 = 0 \quad D = 16 - 4 \cdot 3 \cdot (-4) \\ \quad \quad \quad \quad \quad \quad \quad \quad = 16 + 48 = \underline{\underline{64}} \end{array} \right.$$

$$x_{1,2} = \frac{4 \pm 8}{6}$$

$$x_1 = \frac{12}{6} = \underline{\underline{2}}$$

$$x_2 = \frac{-4}{6} = \underline{\underline{-\frac{2}{3}}}$$

