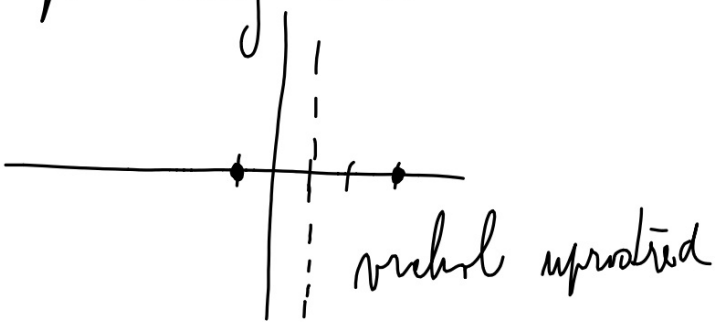
Umíme

$f: y = (x-3)^2 + 1 \Rightarrow V[3;1]$

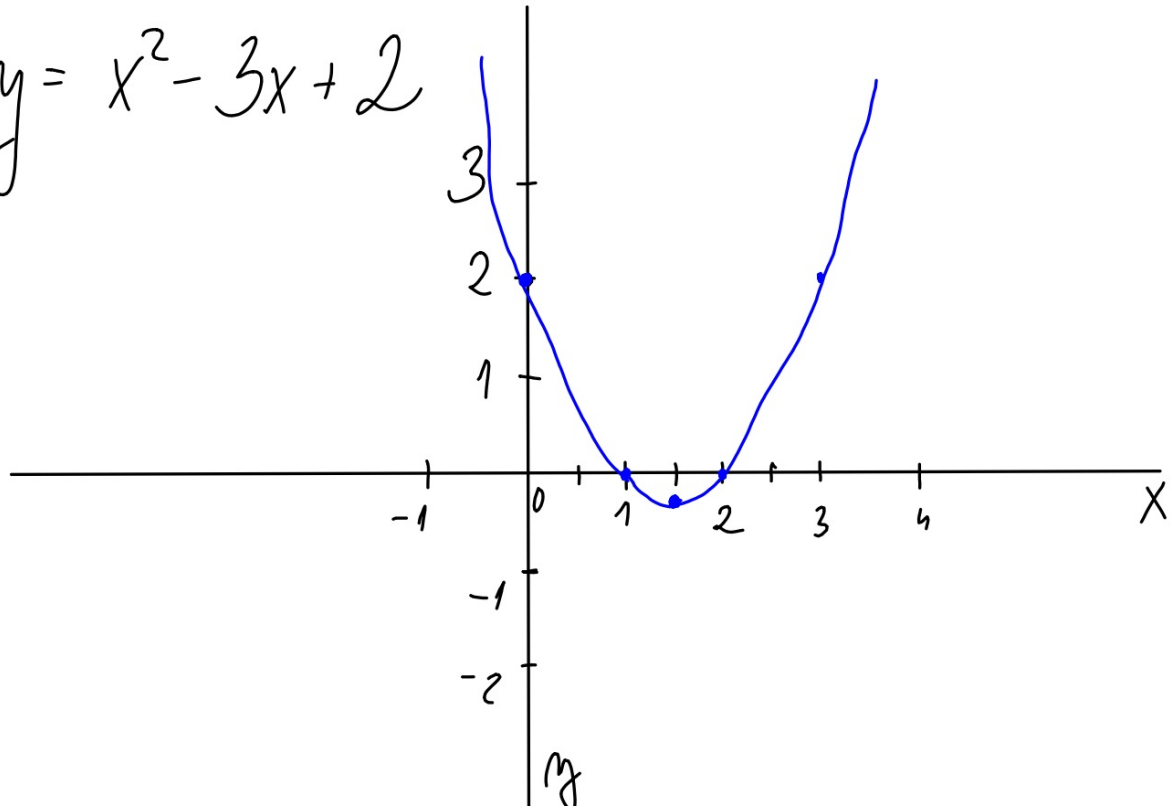
$f: y = (x-3)(x+1)$

$x = 3 \quad x = -1$

průsečíky s X



Př: $f: y = x^2 - 3x + 2$



$y = x^2 - 3x + 2$ $[2;0]$ $[1;0]$

průsečíky s x

$0 = x^2 - 3x + 2$ kvadr. rce

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-3) \pm \sqrt{(-3)^2 - 4 \cdot 1 \cdot 2}}{2 \cdot 1}$$

$$= \frac{3 \pm \sqrt{9-8}}{2} = \frac{3 \pm 1}{2} = \begin{cases} \frac{3+1}{2} = \frac{4}{2} = 2 \\ \frac{3-1}{2} = \frac{2}{2} = 1 \end{cases}$$

Vrchol paraboly

$$x_0 = -\frac{b}{2a}$$

$$y_0 = c - \frac{b^2}{4a}$$

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

$$x_0 = -\frac{b}{2a} = -\frac{-3}{2 \cdot 1} = \frac{3}{2} = 1{,}5$$

$$y_0 = c - \frac{b^2}{4a} = 2 - \frac{(-3)^2}{4 \cdot 1} =$$

$$= 2 - \frac{9}{4} = \frac{8}{4} - \frac{9}{4} = -\frac{1}{4}$$

$$V[1{,}5; -0{,}25]$$

$$f: y = -2x^2 + 12x - 14 = -2(x-3)^2 + 4$$

$$V: \quad x_0 = -\frac{b}{2a} = -\frac{12}{2(-2)} = \frac{-12}{-4} = 3$$

$$y_0 = c - \frac{b^2}{4a} = -14 - \frac{12^2}{4\cdot(-2)} = -14 - \frac{\overset{3}{\cancel{12}}\cdot\overset{-6}{\cancel{12}}}{\cancel{4}\cdot\cancel{(-2)}}$$

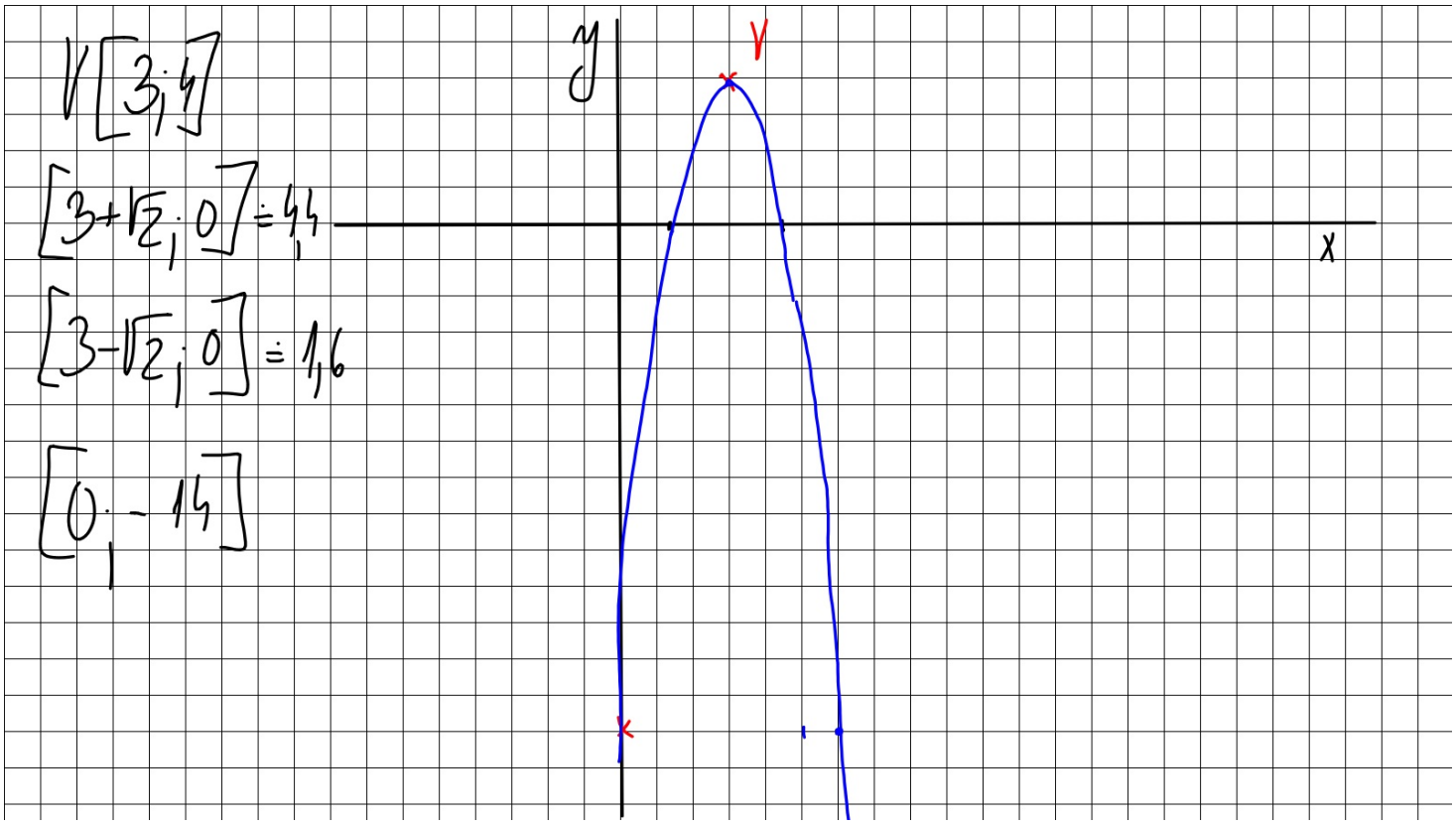
$$= -14 + 18 = 4 \qquad V[3;4]$$

$$-2x^2 + 12x - 14 = 0$$

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-12 \pm \sqrt{12^2 - 4 \cdot (-2)(-14)}}{2 \cdot (-2)}$$

$$x_{1,2} = \frac{-12 \pm \sqrt{144 - 112}}{-4} = \frac{-12 \pm \sqrt{32}}{-4} = \frac{-12 \pm \sqrt{2 \cdot 16}}{-4}$$

$$= \frac{-12 \pm 4\sqrt{2}}{-4} = \frac{-4(3 \pm \sqrt{2})}{-4} = 3 \pm \sqrt{2}$$


V[3;4]
[3+√2; 0] ≐ 4,4
[3-√2; 0] ≐ 1,6
[0; -14]
y
V
x