

Naloga: Določi graf naslednjih funkcij:

Rešitev:

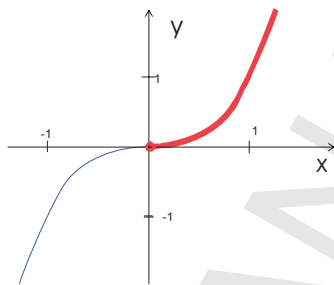
$$a) y = \begin{cases} x^3; & x \geq 0 \\ -x^2; & x < 0 \end{cases}$$

GRAF

Najprej narišem grafa:

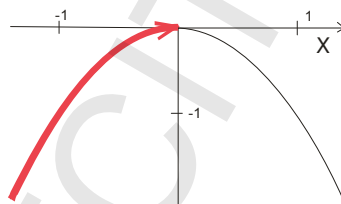
$y_1 = x^3$ in ga pojačam za $x \geq 0$

x	y
0	0
1	1
-1	-1

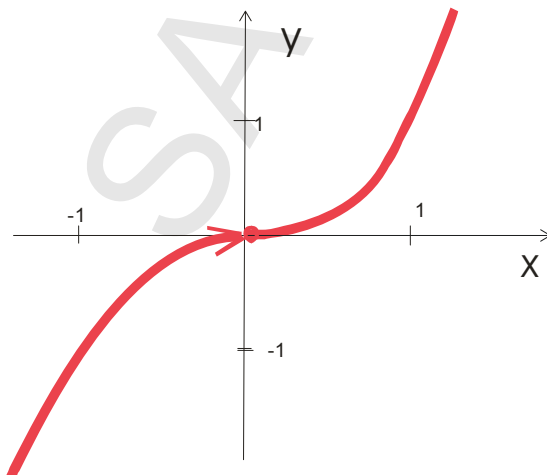


ter $y_2 = -x^2$ in ga pojačam pri $x < 0$.

x	y
0	0
1	-1
-1	-1



Sestavim oba grafa v končen rezultat:

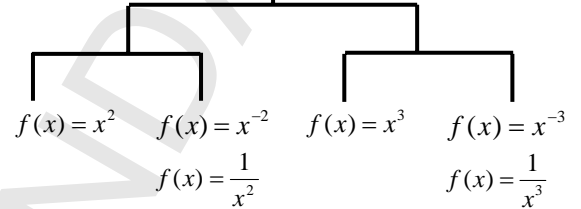


Razlaga:

To je graf potenčne funkcije:

$$f(x) = x^n \quad n \in \{\pm 1, \pm 2, \pm 3, \dots\}$$

n sodo število | n liho število



x	y
0	0
1	1
-1	-1

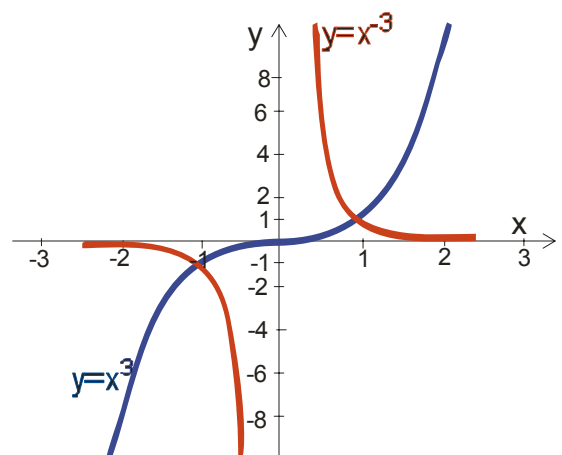
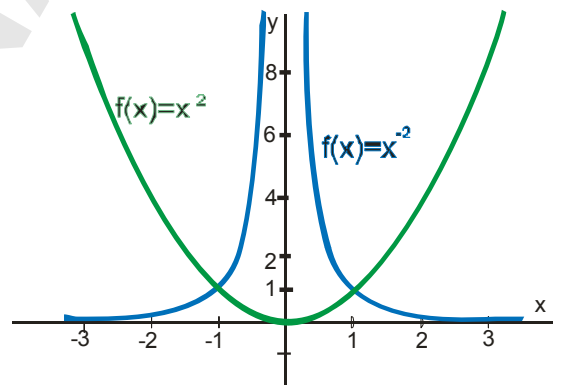
$$f(x) = \frac{1}{x^2}$$

x	y
1	1
-1	1
0	POL

x	y
0	0
1	1
-1	-1

$$f(x) = \frac{1}{x^3}$$

x	y
0	POL
1	1
-1	-1



Potenčna funkcija s premiki po x in y ter raztegom po y pa je:

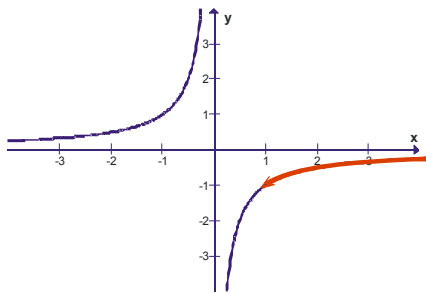
$$f(x) = A(x - p)^n + q$$

$$b) \quad y = \begin{cases} -x^{-1}; & x > 1 \\ -1; & -1 \leq x \leq 1 \\ x^{-1}; & x < -1 \end{cases}$$

GRAF

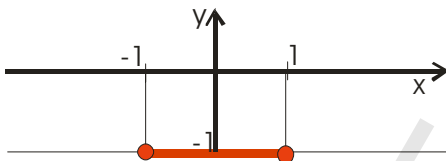
Najprej narišemo potenčno funkcijo:

$y_1 = -x^{-1} = -\frac{1}{x}$ in jo na grafu za $x > 1$ narišem pojačano.



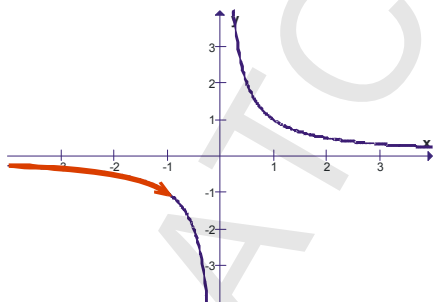
x	y
0	POL
1	-1
-1	1

Nato narišemo $y_2 = -1$. To je konstantna funkcija in jo narišem pojačano na intervalu $[-1, 1]$



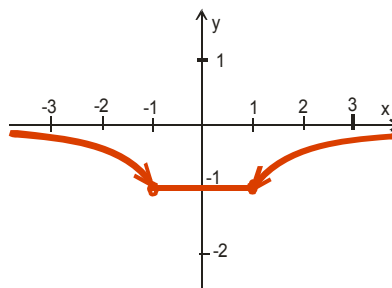
Končno narišem še graf potenčne funkcije:

$y_3 = x^{-1} = \frac{1}{x}$ ter jo narišem pojačano na poltraku $x < -1$



x	y
0	POL
1	1
-1	-1

Vse »SESTAVIM« v en graf in dobim rešitev naloge:



$$c) \quad y = \begin{cases} x^2 - 3; & -2 \leq x \leq 2 \\ 1; & x > 2 \\ -x - 1; & x < -2 \end{cases}$$

GRAF

Narišem posamezne funkcije:

$$y_1 = x^2 - 3$$

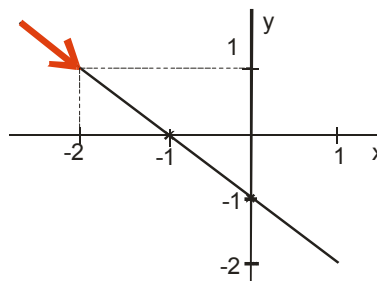
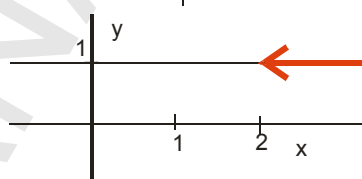
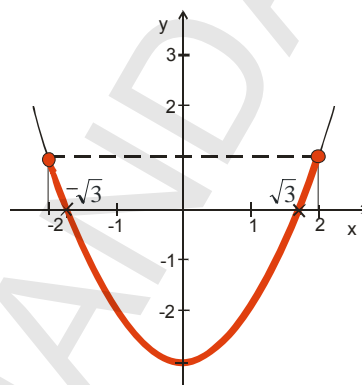
$$\begin{aligned} N: \quad x^2 - 3 &= 0 \\ (x - \sqrt{3})(x + \sqrt{3}) &= 0 \\ x_1 &= \sqrt{3} \\ x_2 &= -\sqrt{3} \end{aligned}$$

$$ZV: \quad y(0) = -3$$

$$y_2 = 1$$

$$y_3 = -x - 1$$

x	y
0	-1
-1	0



Sestavim v končni graf:

