Varianta B

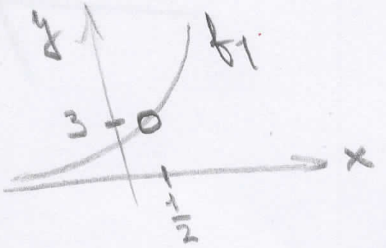
$$f(x)=\frac{1}{9^x-3}$$

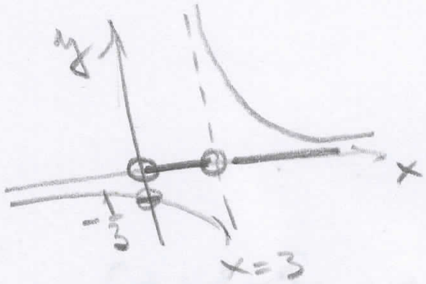
$$9^x-3\neq 0$$
$$9^x\neq 3$$
$$x\neq \frac{1}{2}$$
$$D_f=\mathbb{R}\setminus\left\{\frac{1}{2}\right\}$$
$$H_f=\left(-\infty,-\frac{1}{3}\right)\cup(0,\infty)$$

$$f(x)=(f_2\circ f_1)(x)$$

$$f_1(x)=9^x$$
$$f_2(x)=\frac{1}{x-3}$$

$$\mathbb{R}\setminus\left\{\frac{1}{2}\right\}\xrightarrow{f_1}(0,3)\cup(3,\infty)\xrightarrow{f_2}\left(-\infty,-\frac{1}{3}\right)\cup(0,\infty)$$





$$y=\frac{1}{9^x-3}$$

$$y(9^x-3)=1$$
$$y\cdot 9^x-3y=1$$
$$9^x=\frac{1+3y}{y}$$
$$x=\log_9\left(\frac{1+3y}{y}\right)$$

$$\boxed{f^{-1}:\ y=\log_9\left(\frac{1}{x}+3\right)},\quad x\in\left(-\infty,-\frac{1}{3}\right)\cup(0,\infty)$$

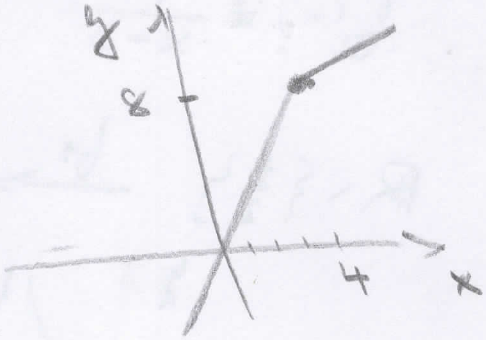
2.

$$f(x)=\begin{cases} cx, & x\leq 4 \\ \dfrac{x^2-16}{x-4}, & x>4 \end{cases}$$

Máme určit $c\in\mathbb{R}$ tak, aby $\lim\limits_{x\to 4_+} f(x) = f(4)$

$$\lim_{x\to 4_+} f(x) = \lim_{x\to 4_+} \frac{x^2-16}{x-4} = \lim_{x\to 4_+} \frac{\cancel{(x-4)}(x+4)}{\cancel{x-4}} = 4+4 = 8$$

$$f(4) = 4c = 8 \implies c=2$$



3.

$$f(x) = x^3-3x+2 \qquad D=\mathbb{R}$$

$$f'(x) = 3x^2-3 = 0 \quad |:3$$

$$x^2-1 = 0$$

$$x=\pm 1$$

$f'>0$ $\quad -1 \quad$ $f'<0$ $\quad 1 \quad$ $f'>0$

$f(1)=0$ ... lok. minimum $[1;0]$

$f(-1)=4$ ... lok. maximum $[-1;4]$

$$f''(x) = 6x = 0 \iff x=0$$

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$f''<0$ $\quad 0 \quad$ $f''>0$

$f(0)=2$ ... inflexní bod $[0,2]$