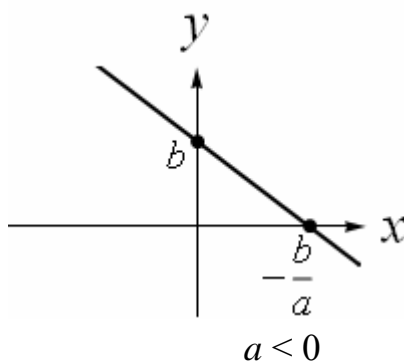
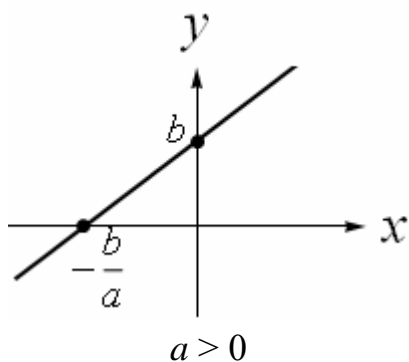


## ELEMENTARNE FUNKCIJE I NJIHOVI GRAFICI

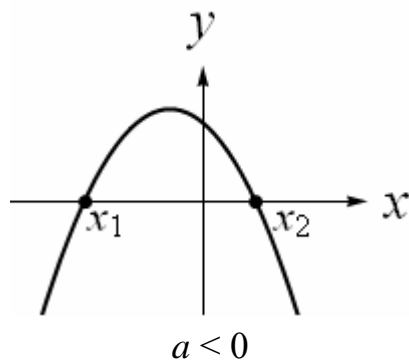
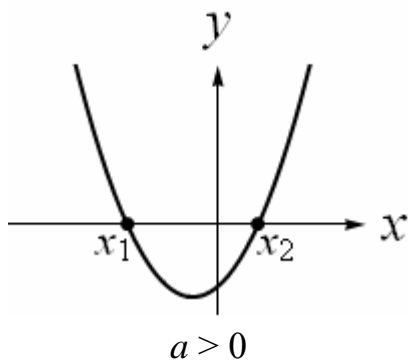
1.  $y = ax + b$

presek sa  $x$ - osom:  $y = 0 \Rightarrow x = -\frac{b}{a}$ ; presek sa  $y$ -osom:  $x = 0 \Rightarrow y = b$



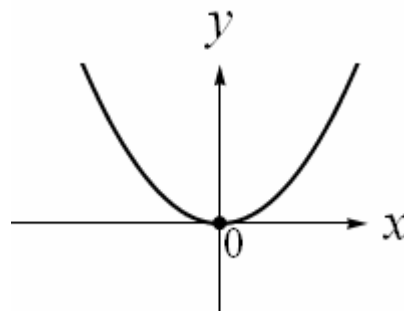
2.  $y = ax^2 + bx + c \quad (b^2 - 4ac > 0)$

presek sa  $x$ - osom:  $y = 0 \Rightarrow x_1 = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$ ,  $x_2 = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$

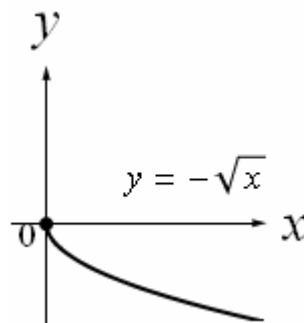
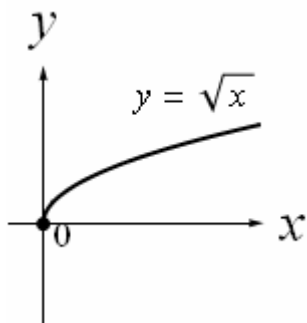


3.  $y = x^2$

- specijalni slučaj za 2.;
- parna;
- nema inverznu

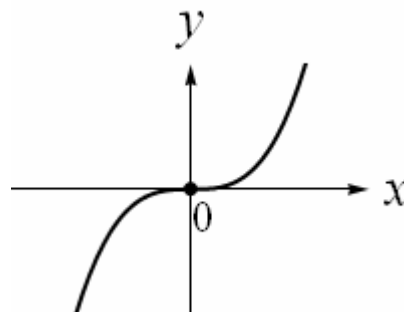


4.  $y = \sqrt{x}; \quad y = -\sqrt{x}$



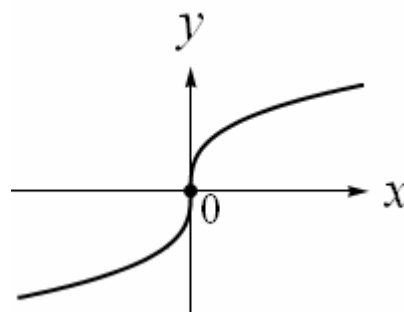
5.  $y = x^3$

- neparna



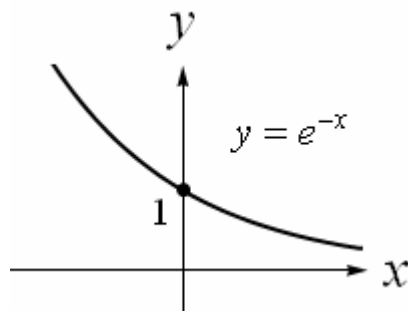
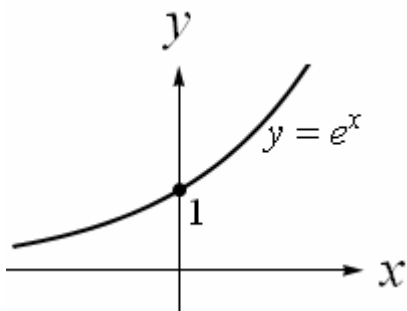
6.  $y = \sqrt[3]{x}$

- neparna;
- inverzna za  $y = x^3$



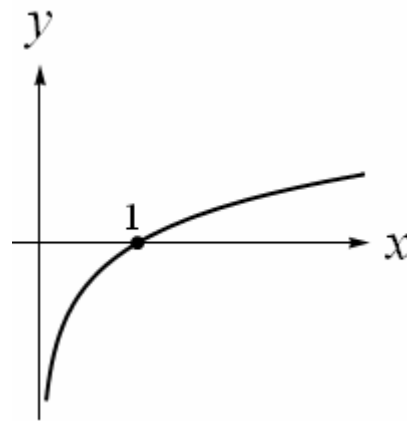
7.  $y = e^x; \quad y = e^{-x}$

- presek sa y-osom:  $x=0 \Rightarrow y=1$ ;
- horizontalna asimptota  $x$ -osa;
- važi jednakost  $e^{x_1+x_2} = e^{x_1} e^{x_2}$



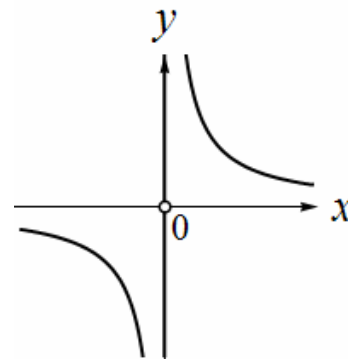
8.  $y = \ln x$

- definisana za  $x > 0$ ;
- inverzna za  $y = e^x$ ;
- presek sa  $x$ -osom:  $y = 0 \Rightarrow x = 1$ ;
- vertikalna asimptota  $y$ -osa;
- važi jednakost  $\ln x_1 x_2 = \ln x_1 + \ln x_2$



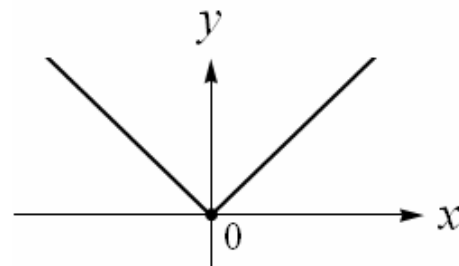
9.  $y = \frac{1}{x}$

- neparna



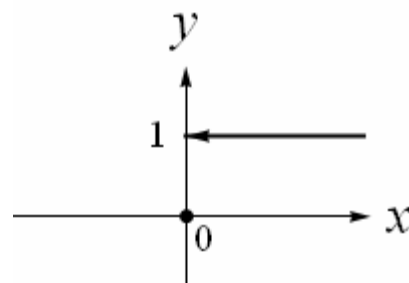
10.  $y = |x| = \begin{cases} -x, & x < 0 \\ 0, & x = 0 \\ +x, & x > 0 \end{cases}$

- parna

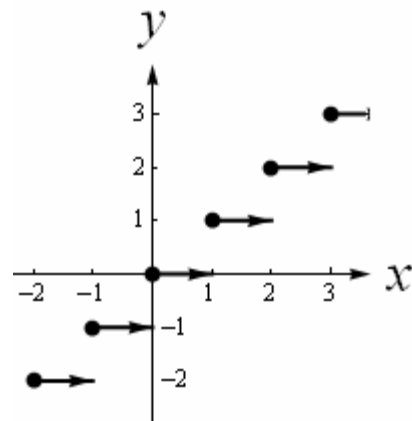


11.  $y = \operatorname{sgn} x = \begin{cases} -1, & x < 0 \\ 0, & x = 0 \\ +1, & x > 0 \end{cases}$

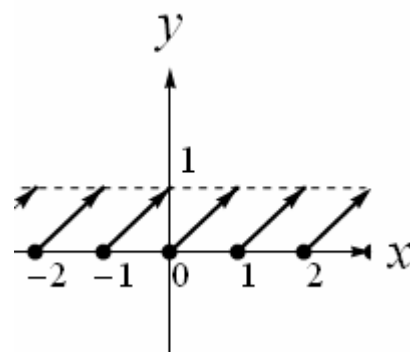
- neparna



12.  $y = [x] = k, x \in [k, k+1), k \in \mathbb{Z}$

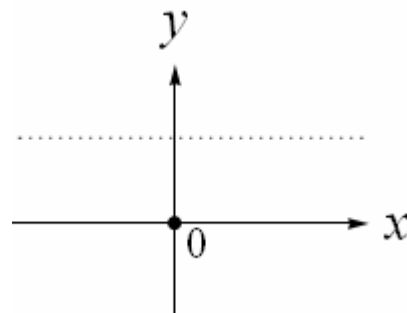


13.  $y = (x) = x - [x]$



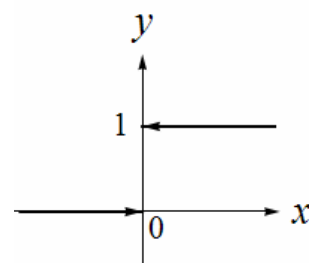
14.  $y = \begin{cases} 1, & x \in \mathbb{Q} \text{ (racionalni)} \\ 0, & x \in \mathbb{I} \text{ (iracionalni)} \end{cases}$

- Dirihleova funkcija

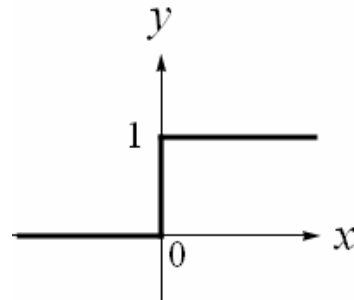


15.  $y = y(x) = \begin{cases} 1, & x > 0 \\ 0, & x < 0 \end{cases}$

- Hevisajdova funkcija

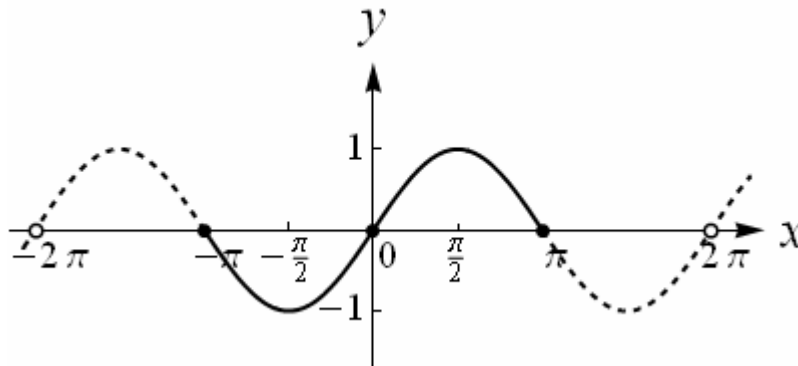


- Hevisajdova kriva



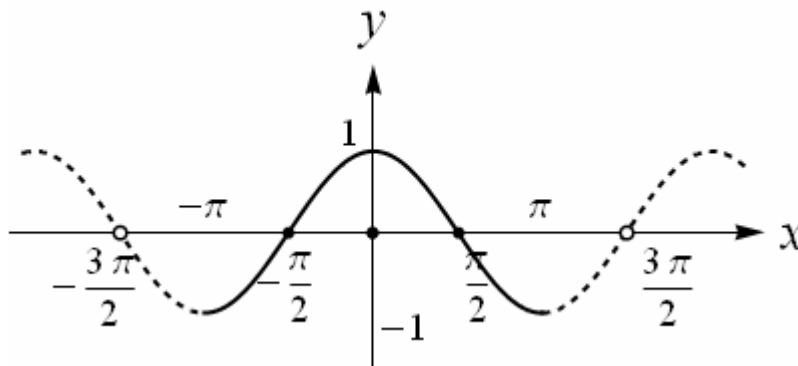
16.  $y = \sin x$

- vrednosti iz  $[-1, 1]$ ;
- neparna;
- periodična sa osnovnim periodom  $2\pi$



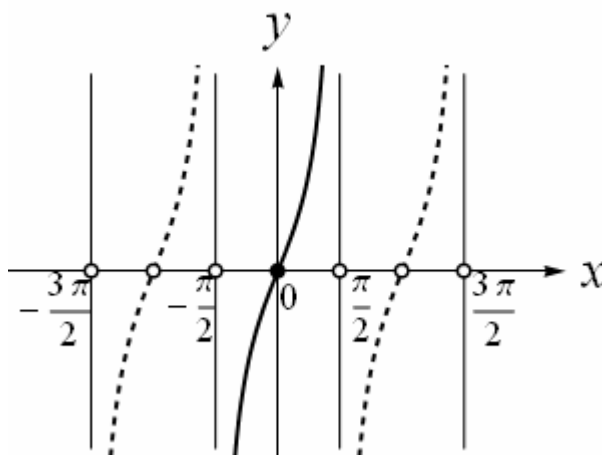
17.  $y = \cos x$

- vrednosti iz  $[-1, 1]$ ;
- parna;
- periodična sa osnovnim periodom  $2\pi$



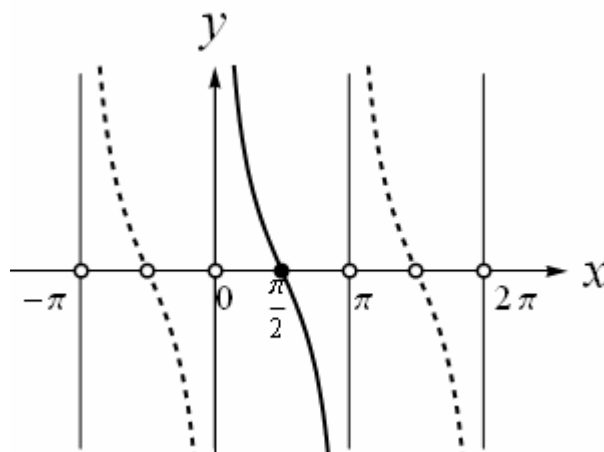
18.  $y = \operatorname{tg} x$

- vertikalne asimptote  
 $x = \frac{\pi}{2} + k\pi, k \in \mathbb{Z};$
- neparna;
- periodična sa  
osnovnim periodom  $\pi$



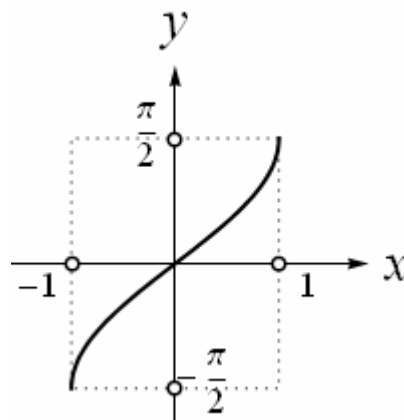
19.  $y = \operatorname{ctg} x$

- vertikalne asimptote  
 $x = k\pi, k \in \mathbb{Z};$
- periodična sa  
osnovnim periodom  $\pi$



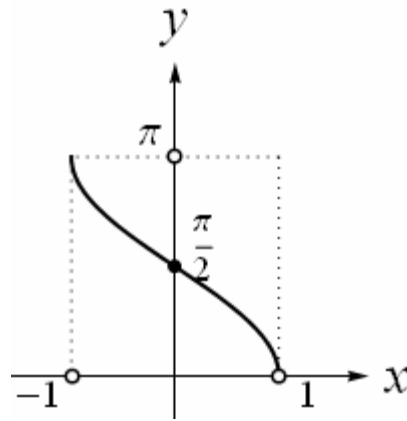
20.  $y = \arcsin x$

- definisana za  $x \in [-1, 1];$
- vrednosti iz  $[-\pi/2, \pi/2];$
- neparna;
- inverzna za  $y = \sin x, x \in [-\pi/2, \pi/2]$



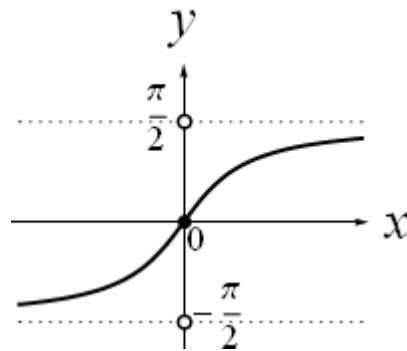
21.  $y = \arccos x$

- definisana za  $x \in [-1, 1]$ ;
- vrednosti iz  $[0, \pi]$ ;
- inverzna za  $y = \cos x, x \in [0, \pi]$



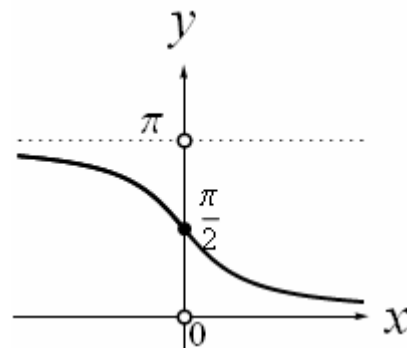
22.  $y = \arctg x$

- neparna;
- horizontalne asimptote  $y = \pm \frac{\pi}{2}$ ;
- inverzna za  $y = \operatorname{tg} x, x \in (-\pi/2, \pi/2)$



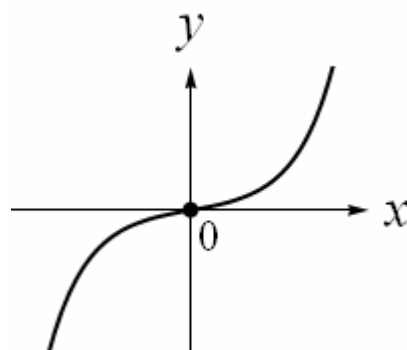
23.  $y = \operatorname{arcctg} x$

- horizontalne asimptote  $y = 0, y = \pi$ ;
- inverzna za  $y = \operatorname{ctg} x, x \in (0, \pi)$



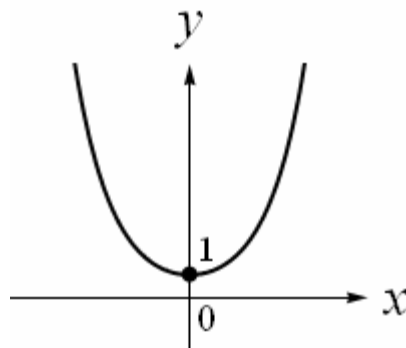
24.  $y = \operatorname{sh} x = \frac{e^x - e^{-x}}{2}$

- neparna



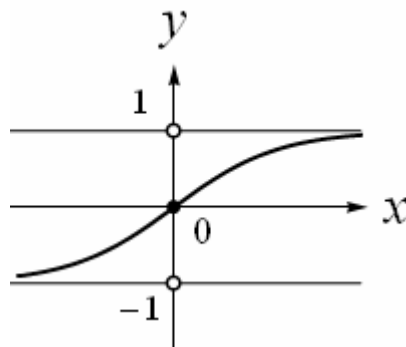
$$25. \quad y = \operatorname{ch} x = \frac{e^x + e^{-x}}{2}$$

- parna;
- važe jednakosti  
 $\operatorname{ch}^2 x - \operatorname{sh}^2 x = 1$ ,  $\operatorname{sh} 2x = 2 \operatorname{sh} x \operatorname{ch} x$ ,  
 $\operatorname{ch} 2x = \operatorname{ch}^2 x + \operatorname{sh}^2 x$



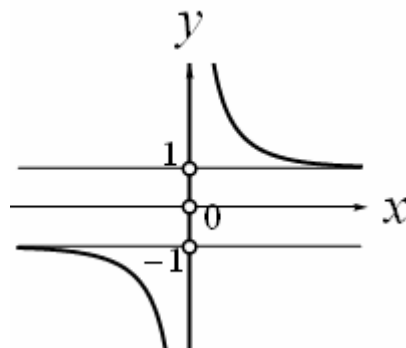
$$26. \quad y = \operatorname{th} x = \frac{\operatorname{sh} x}{\operatorname{ch} x} = \frac{e^{2x} - 1}{e^{2x} + 1}$$

- neparna;
- horizontalne asimptote  $y = -1$ ,  $y = +1$



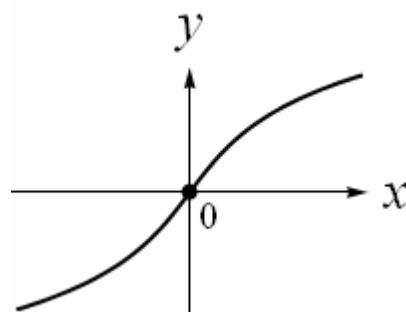
$$27. \quad y = \operatorname{cth} x = \frac{\operatorname{ch} x}{\operatorname{sh} x} = \frac{e^{2x} + 1}{e^{2x} - 1}$$

- horizontalne asimptote  $y = -1$ ,  $y = +1$ ;
- vertikalna asimptota  $x = 0$



$$28. \quad y = \operatorname{areash} x = \ln \left( x + \sqrt{x^2 + 1} \right)$$

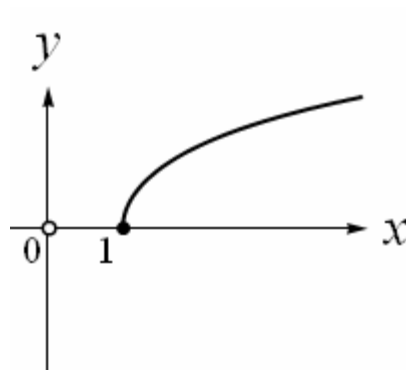
- neparna;
- inverzna za  $y = \operatorname{sh} x$





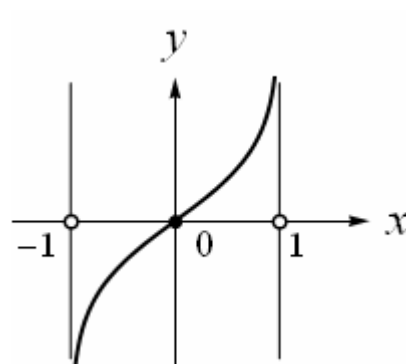
29.  $y = \operatorname{arcsch} x = \ln \left( x + \sqrt{x^2 - 1} \right)$

- inverzna za  $y = \operatorname{ch} x, x \in [0, +\infty)$



30.  $y = \operatorname{arcth} x = \ln \sqrt{\frac{1+x}{1-x}}$

- inverzna za  $y = \operatorname{th} x$



31.  $y = \operatorname{aracth} x = \ln \sqrt{\frac{1+x}{x-1}}$

- inverzna za  $y = \operatorname{cth} x$

