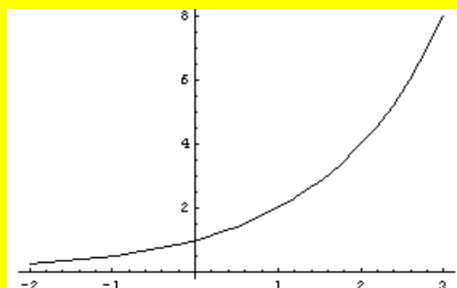


Logaritmická funkce

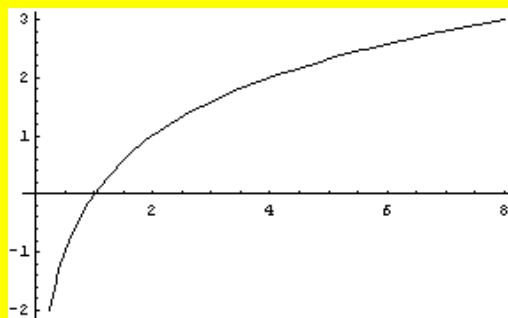
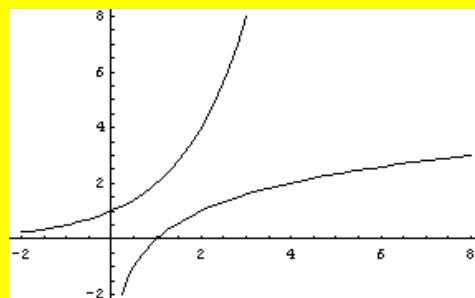
$$f: y = a^x$$

$$f^{-1}: x = a^y \Rightarrow y = \log_a x$$

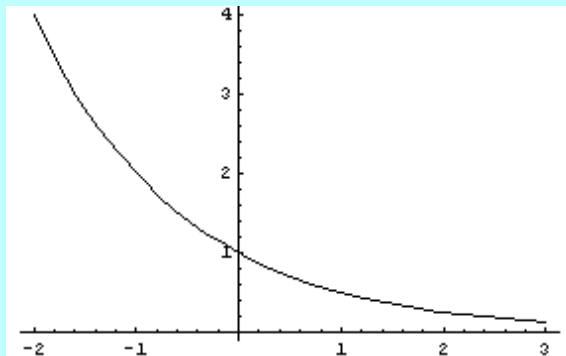
$$y = 2^x$$



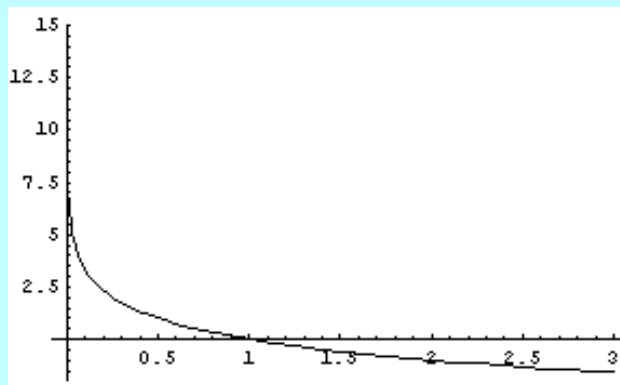
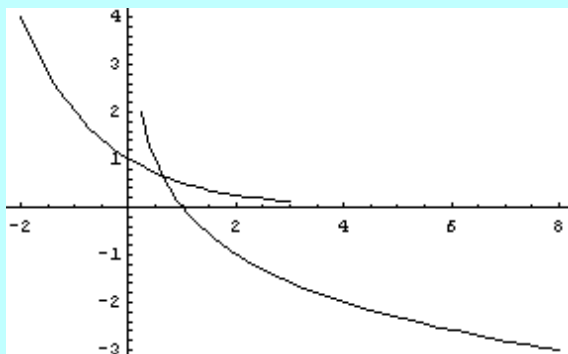
$$y = \log_2 x$$



$$y = \left(\frac{1}{2}\right)^x$$

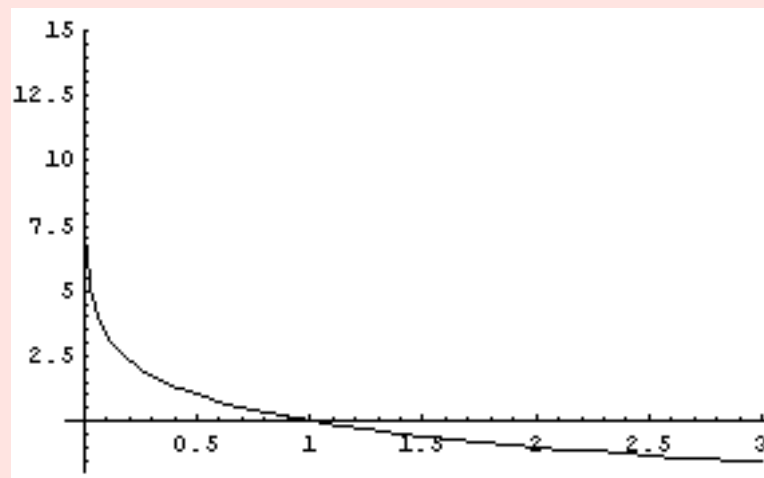


$$y = \log_{\frac{1}{2}} x$$

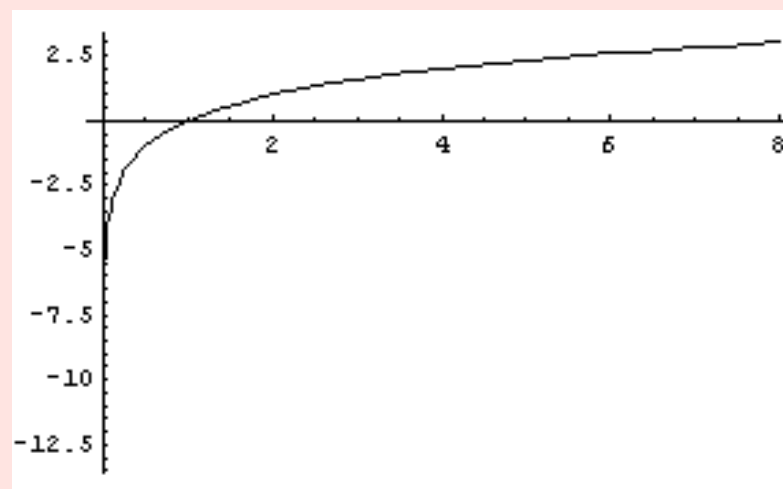


Vlastnosti logaritmické funkce:

$$y = \log_{\frac{1}{2}} x$$



$$y = \log_2 x$$



Určete definiční obor funkce

$$f_1: y = \log_5(x+1)$$

$$f_2: y = \log_2 \frac{x+1}{x}$$

$$f_3: y = \log_{10} \frac{1-x}{x+2}$$

$$f_4: y = \sqrt{\log_2 x}$$

$$f_5: y = \sqrt{\log_2 \frac{1}{x}}$$

$$f_6: y = \frac{1}{\sqrt{\log_2 x}}$$

$$f_7: y = \log_3(x^2 - 4x + 4)$$

$$f_8: y = \frac{\log_3(3x-2)}{x^2 - x - 2}$$

$$f_9: y = \sqrt[4]{\log(3x^2 - 2x)}$$

$$f_{10}: y = \sqrt{\log_{\frac{1}{2}} \log_3 \frac{x+1}{x-1}}$$

Pojem: logaritmus

Logaritmus je exponent, kterým umocníme základ logaritmu a vyjde argument x

$$a^{\log_a x} = x$$

Vypočítejte:

$$\log_7 \sqrt{7} =$$

$$\log_5 125 =$$

$$\log_8 \sqrt{2} =$$

$$\log_{\sqrt{2}} 16 =$$

$$\log_{\frac{1}{3}} 9 =$$

$$\log_{\sqrt{5}} 1 =$$

$$\log_{0,25} 4 =$$

$$\log_{0,2} 0,04 =$$

Najděte všechna kladná čísla x , pro která platí

$$\log_3 x = 4$$

$x =$

$$\log_{\sqrt{2}} x = 4$$

$x =$

$$\log_{\frac{1}{5}} x = -1$$

$x =$

$$\log_{\frac{1}{4}} x = \frac{3}{2}$$

$x =$

$$\log_5 x = 0$$

$x =$

$$\log_a x = -\frac{3}{5}$$

$x =$

Najděte všechna kladná čísla a , pro která platí

$$\log_a 27 = 3$$

$a =$

$$\log_a 4 = \frac{1}{4}$$

$a =$

$$\log_a \frac{1}{3} = 3$$

$a =$

$$\log_a \frac{1}{16} = 4$$

$a =$

$$\log_a 8 = 6$$

$a =$

$$\log_a \sqrt{8} = 3$$

$a =$

Doplňte tabulky:

x	$\frac{1}{4}$		0		0,5		$-\frac{1}{2}$		$\frac{1}{16}$
$\log_{\frac{1}{2}} x$		-3		3		$-\frac{1}{2}$		0	

x	0,01		10		-3		0		$\sqrt[5]{10}$
$\log_{0,1} x$		-2		3		-3		0	

x	3		1	
$\log_x x$	$\frac{1}{2}$	-2		1

x	0,2	-5		0,04
$\log_x x$	-1		3	

Nakreslete graf logaritmické funkce:

$$f_1 : y = \log_2 x$$

$$f_2 : y = \log_2 (x + 1)$$

$$f_3 : y = \log_2 |x|$$

$$f_4 : y = \log_2 (-x)$$

$$f_5 : y = \log_2 x + 2$$

$$f_6 : y = \log_2 (x - 2) + 3$$

Výsledky - přiřaďte graf
fčnímu předpisu

$$f_1: y = \log_2 x$$

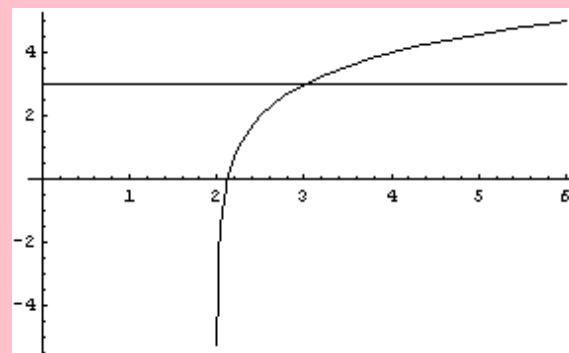
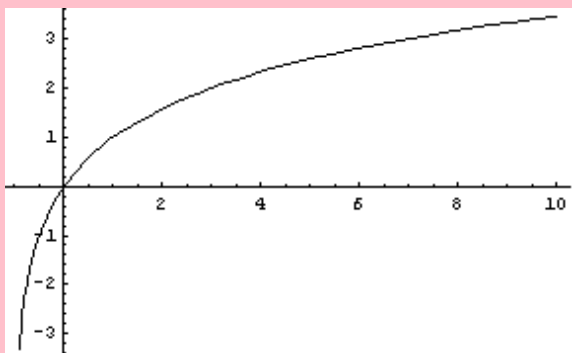
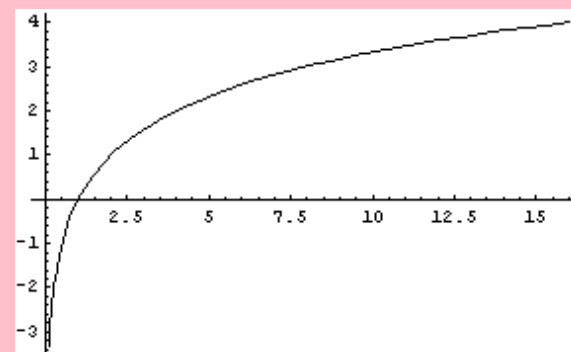
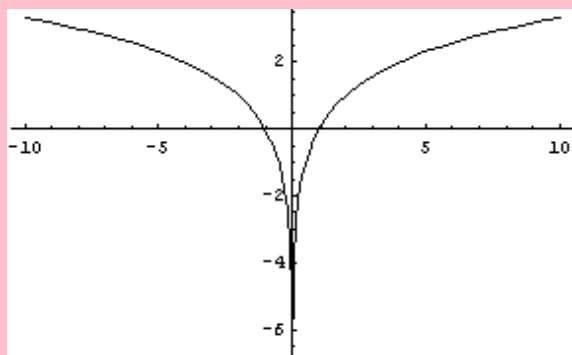
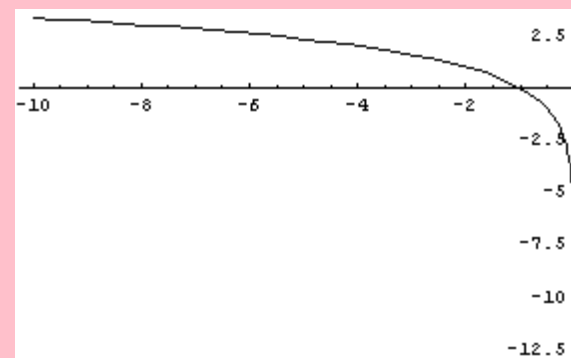
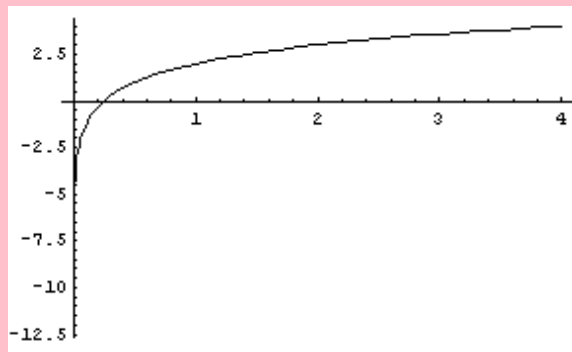
$$f_2: y = \log_2(x+1)$$

$$f_3: y = \log_2 |x|$$

$$f_4: y = \log_2(-x)$$

$$f_5: y = \log_2 x + 2$$

$$f_6: y = \log_2(x-2) + 3$$



Nakreslete graf logaritmické funkce:

$$f_7: y = \log_{\frac{1}{2}}(x) - 2$$

$$f_8: y = \log_{\frac{1}{2}}(x - 2)$$

$$f_9: y = -\log_{\frac{1}{2}}(x - 2)$$

$$f_{10}: y = \log_{\frac{1}{2}}(x + 1) - 3$$

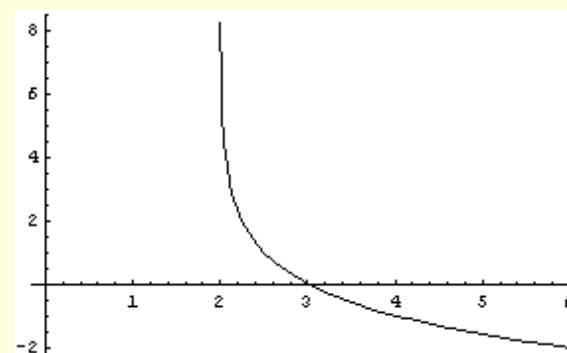
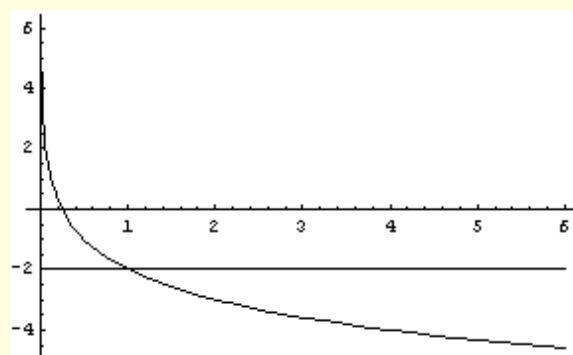
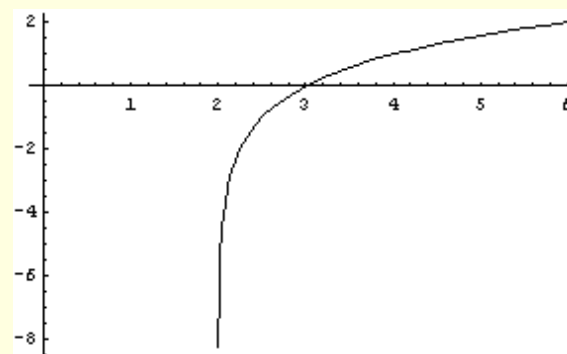
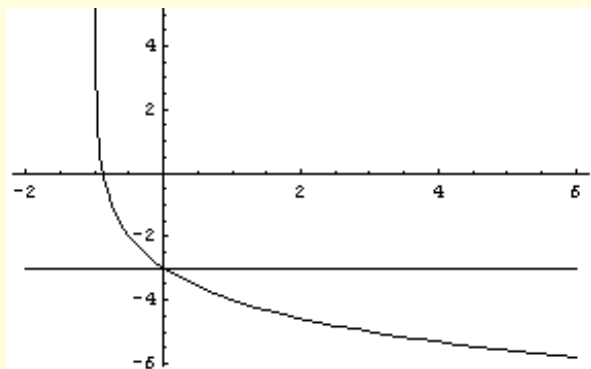
Výsledky - přiřaďte graf
fčnímu předpisu

$$f_7: y = \log_{\frac{1}{2}}(x) - 2$$

$$f_8: y = \log_{\frac{1}{2}}(x - 2)$$

$$f_9: y = -\log_{\frac{1}{2}}(x - 2)$$

$$f_{10}: y = \log_{\frac{1}{2}}(x + 1) - 3$$



pravda nepravda

Rozhodněte o pravdivosti výroků:

$$\log_2 5 > 0$$

$$\log_{\frac{1}{2}} 2 > 0$$

$$\log_2 \frac{1}{2} > 0$$

$$\log_5 2 > 1$$

$$\log_{\frac{1}{3}} 0,2 > 1$$

$$\log_{\frac{1}{3}} \frac{1}{9} > 1$$

$$\log_{\frac{1}{3}} \frac{1}{9} < 1$$

$$\log_{\sqrt{8}} \frac{1}{4} < 1$$

$$\log_{\sqrt{0,5}} 5 < 0$$

$$\log_{\sqrt{0,2}} 5 < \log_{\sqrt{0,2}} 2$$

$$\log_{\sqrt{20}} 0,5 < \log_{\sqrt{20}} 2$$

$$\log_{\frac{1}{2}} 3 > \log_{\frac{1}{2}} 2$$

$$\log_{\frac{1}{2}} 2 \leq \log_2 \frac{1}{2}$$

$$\log_a 2 \leq \log_a \frac{1}{2} \Rightarrow a \in (0, 1)$$

$$\log_a \sqrt{3} \leq \log_a 3 \Rightarrow a \in (0, 1)$$

$$\log_a \sqrt{3} \leq \log_a \sqrt{\frac{2}{5}} \Rightarrow a \in (1, \infty)$$

$$\log_a 5,5 \geq \log_a 1,2 \Rightarrow a \in (1, \infty)$$