

EKSPONENTNE ENAČBE

$$16^x = 2^1$$

$$(2^4)^x = 2^1$$

$$2^{4x} = 2^1$$

$$4x = 1 \quad | :4$$

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

$$3^{x-2} = 1$$

$$3^{x-2} = 3^0$$

$$x-2 = 0$$

$$x = 2$$

$$3^{2x-5} = 27$$

$$3^{2x-5} = 3^3$$

$$2x-5 = 3$$

$$2x = 3+5$$

$$2x = 8 \quad | :2$$

$$x = 4$$

$$x+3 = x+7x$$

$$16 = 2^4 \rightarrow \underbrace{2 \cdot 2}_4 \cdot \underbrace{2 \cdot 2}_4 = 16$$

$$(2^3)^2 = 2^6$$

$$3^0 = 1$$

$$3^3 = 27$$

$$2^{x^2-3x+4} = 4$$

$$2^{x^2-3x+4} = 2^2$$

$$x^2-3x+4=2$$

$$x^2-3x+4-2=0$$

$$x^2-3x+2=0$$

$$a=1 \quad b=-3 \quad c=2$$

$$D=b^2-4ac$$

$$D=(-3)^2-4 \cdot 1 \cdot 2$$

$$D=9-8=\underline{\underline{1}}$$

$$x_1 = \frac{-b+\sqrt{D}}{2a}$$

$$x_2 = \frac{-b-\sqrt{D}}{2a}$$

$$x_1 = \frac{-(-3)+\sqrt{1}}{2 \cdot 1}$$

$$x_2 = \frac{-(-3)-\sqrt{1}}{2 \cdot 1}$$

$$x_1 = \frac{3+1}{2}$$

$$x_2 = \frac{3-1}{2}$$

$$x_1 = \underline{\underline{2}}$$

$$x_2 = \underline{\underline{1}}$$

$$2^{2x-1} \cdot 8 = 1$$

$$2^{2x-1} \cdot 2^3 = 2^0$$

$$2^{2x-1+3} = 2^0$$

$$2x-1+3=0$$

$$2x = +1-3$$

$$2x = -2 : 2$$

$$\underline{\underline{x = -1}}$$

$$\underline{a^n} \cdot \underline{a^m} = a^{n+m}$$

$$3^{2x+1} \cdot \frac{1}{9} = 27$$

$$3^{2x+1} \cdot \frac{1}{3^2} = 3^3$$

$$3^{2x+1} \cdot 3^{-2} = 3^3$$

$$3^{2x+1+(-2)} = 3^3$$

$$2x+1-2=3$$

$$2x = 3-1+2$$

$$2x = 4 : 2$$

$$\underline{\underline{x=2}}$$

$$4 \cdot 2^{x-3} = \frac{1}{8}$$

$$2^2 \cdot 2^{x-3} = \frac{1}{2^3}$$

$$2^2 \cdot 2^{x-3} = 2^{-3}$$

$$2^{2+x-3} = 2^{-3}$$

$$2+x-3=-3$$

$$x = -3+3-2$$

$$\underline{\underline{x=-2}}$$

$$a^{-n} = \left(\frac{1}{a^n} \right)$$

$$\frac{1}{3^2} = 3^{-2}$$

$$3^{x+1} - 3^{x-1} = 72$$

$$3^{x-1} \cdot (3^2 - 3^0) = 72$$

$$3^{x-1} (9 - 1) = 72$$

$$3^{x-1} \cdot 8 = 72 \quad / : 8$$

$$3^{x-1} = 9$$

$$3^{x-1} = 3^2$$

$$x - 1 = 2$$

$$x = 2 + 1$$

$$\underline{\underline{x = 3}}$$

$$2^{x+3} + 2^x = 18$$

$$2^x (2^3 + 2^0) = 18$$

$$2^x (8 + 1) = 18$$

$$2^x \cdot 9 = 18 \quad / : 9$$

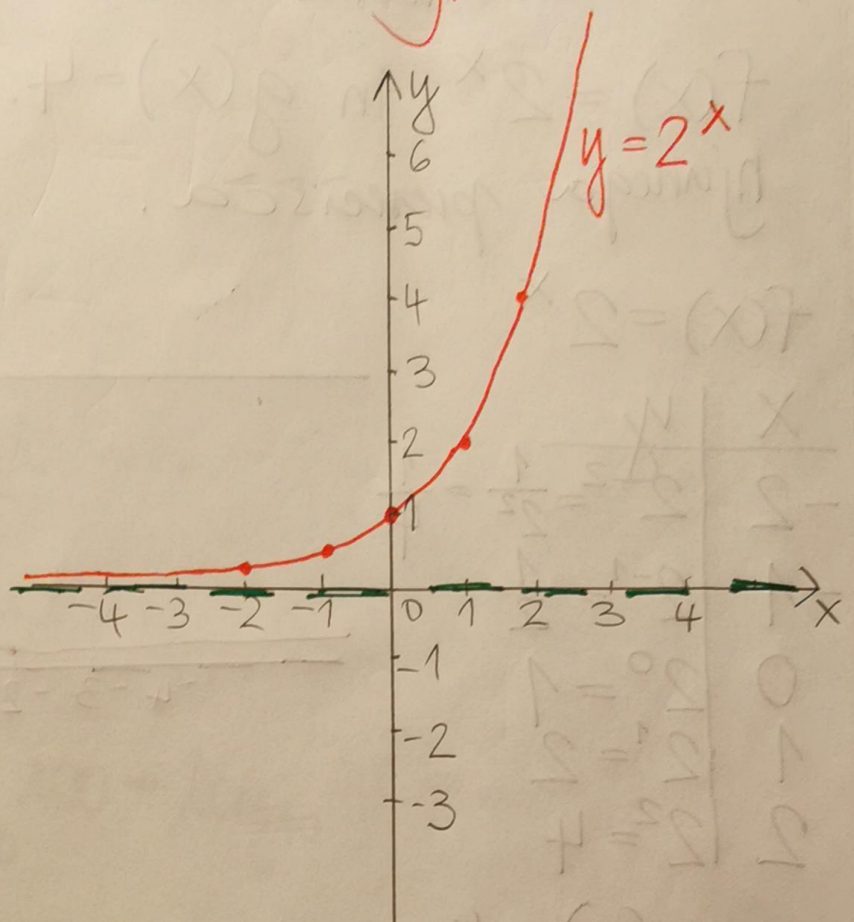
$$2^x = 2^1$$

$$\underline{\underline{x = 1}}$$

EKSPONENTNA FUNKCIJA

$$f(x) = 2^x$$

x	y	
-2	$2^{-2} = \frac{1}{4}$	$(-2, \frac{1}{4})$
-1	$2^{-1} = \frac{1}{2}$	$(-1, \frac{1}{2})$
0	$2^0 = 1$	$(0, 1)$
1	$2^1 = 2$	$(1, 2)$
2	$2^2 = 4$	$(2, 4)$



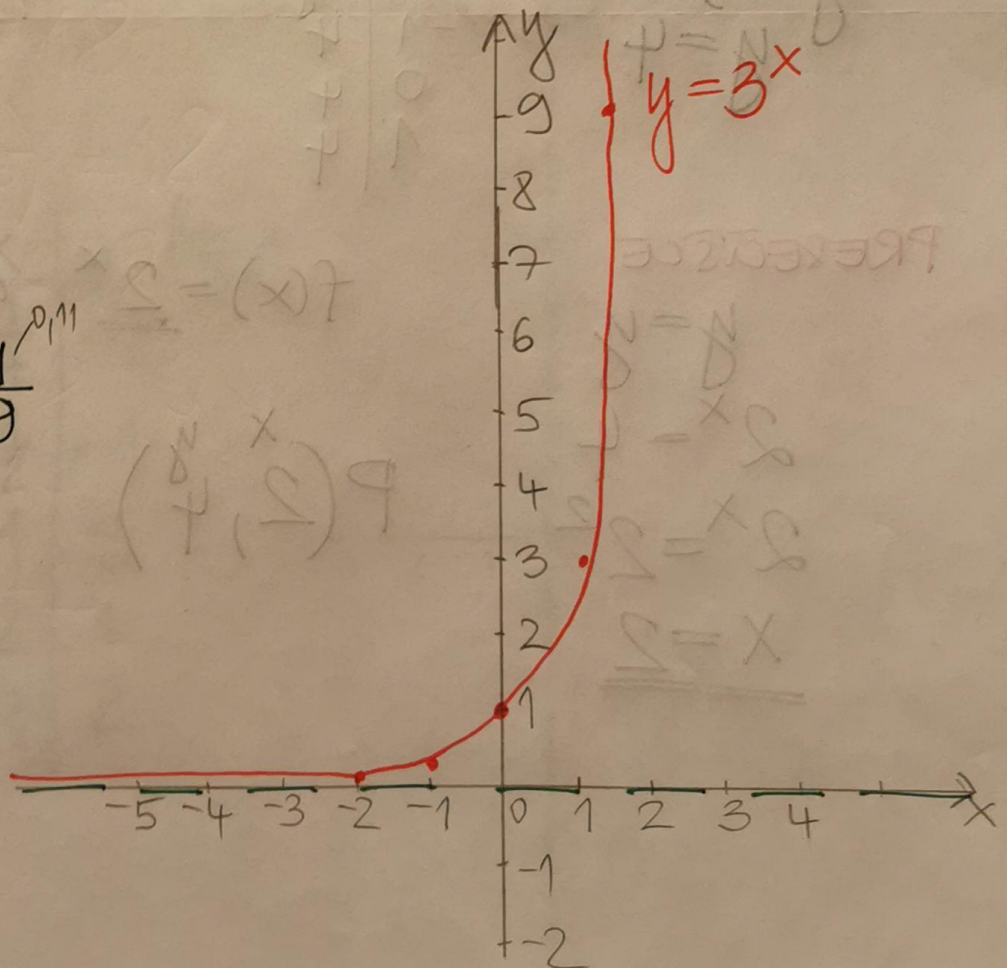
$$a^{-n} = \frac{1}{a^n}$$

$$2^{-1} = \frac{1}{2^1} = \frac{1}{2}$$

$$2^{-2} = \frac{1}{2^2} = \frac{1}{4}$$

$$f(x) = 3^x$$

x	y
-2	$3^{-2} = \frac{1}{3^2} = \frac{1}{9}$
-1	$3^{-1} = \frac{1}{3}$
0	$3^0 = 1$
1	$3^1 = 3$
2	$3^2 = 9$



V isti koordinatni sistem nariši graf funkcije $f(x) = 2^x$ in $g(x) = 4$. Zapiši koordinati njunega presečišča.

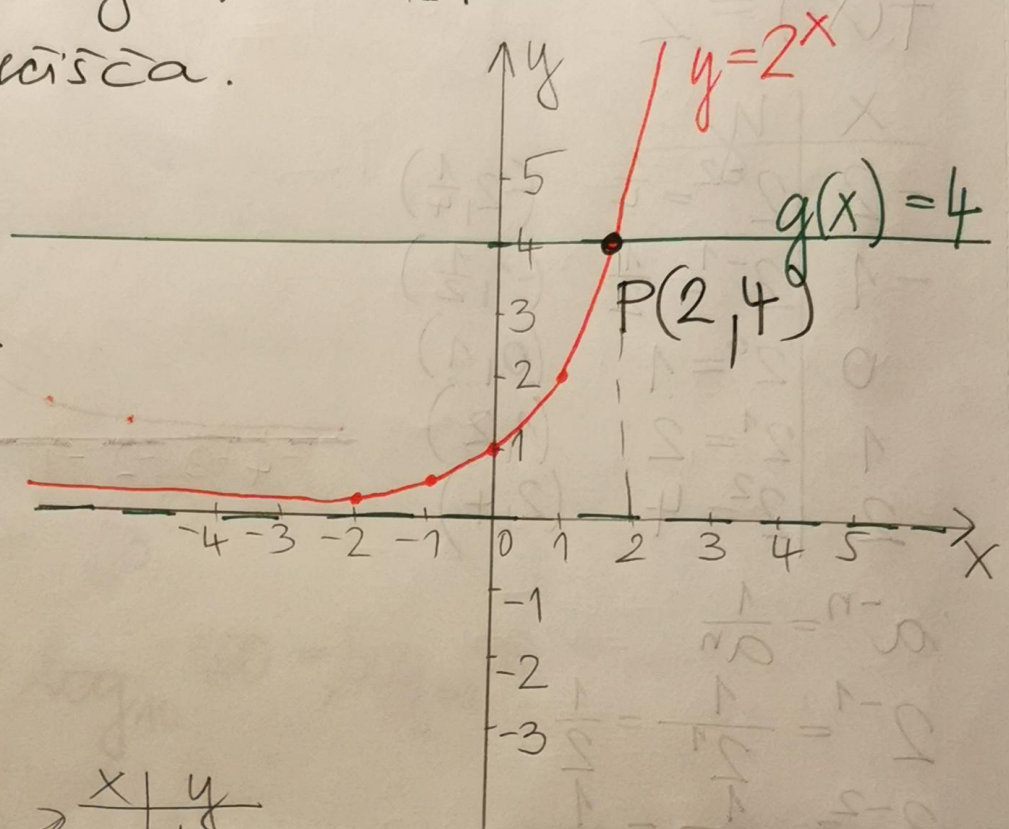
$$f(x) = 2^x$$

x	y
-2	$2^{-2} = \frac{1}{2^2} = \frac{1}{4}$
-1	$2^{-1} = \frac{1}{2}$
0	$2^0 = 1$
1	$2^1 = 2$
2	$2^2 = 4$

$$g(x) = 4$$

$$y = 4$$

x	y
-1	4
0	4
1	4



PRESEČIŠČE

$$y = y$$

$$2^x = 4$$

$$2^x = 2^2$$

$$\underline{\underline{x = 2}}$$

$$f(x) = \underline{2^x} \quad g(x) = \underline{4}$$

$$P(2^x, y)$$

LOGARITEMSKA FUNKCIJA

$$f(x) = \log_a x$$

→ LOGARITAM
→ OSNOVA

$$\log_2 4 = \log_2 2^2 = 2$$

$$\log_2 16 = \log_2 2^4 = 4$$

$$\log_3 81 = \log_3 3^4 = 4$$

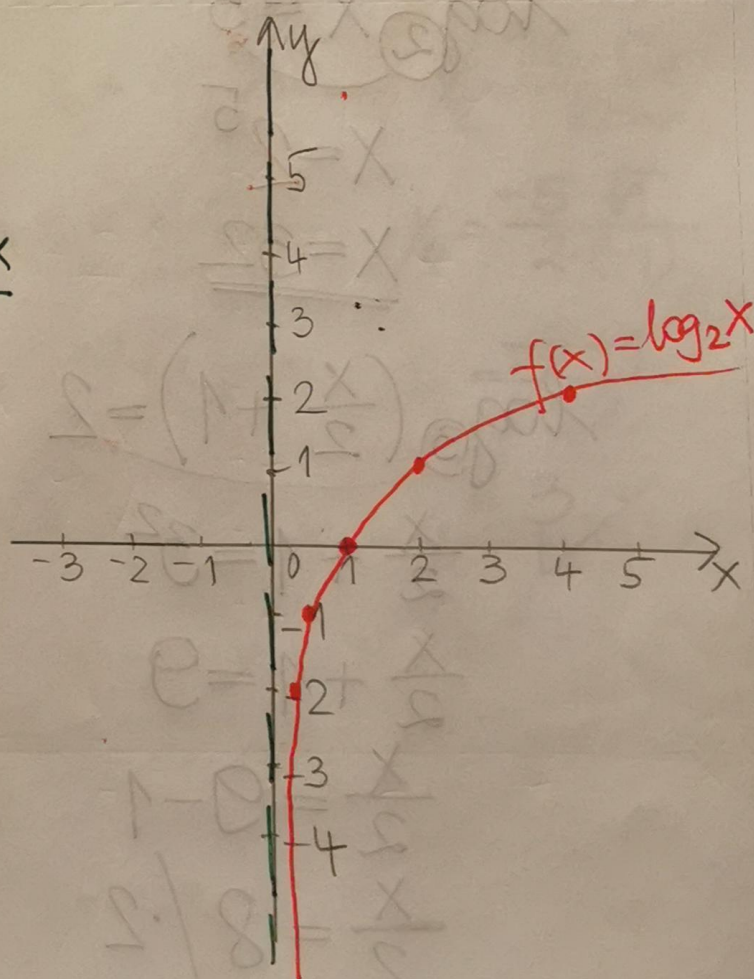
$$\log 100 = \log_{10} 100 = \log_{10} 10^2 = 2$$

$$f(x) = \log_2 x$$

$$y = 2^x$$

x	y = 2 ^x
-2	2 ⁻² = $\frac{1}{4}$
-1	2 ⁻¹ = $\frac{1}{2}$
0	2 ⁰ = 1
1	2 ¹ = 2
2	2 ² = 4

x	y = log ₂ x
$\frac{1}{4}$	-2
$\frac{1}{2}$	-1
1	0
2	1
4	2



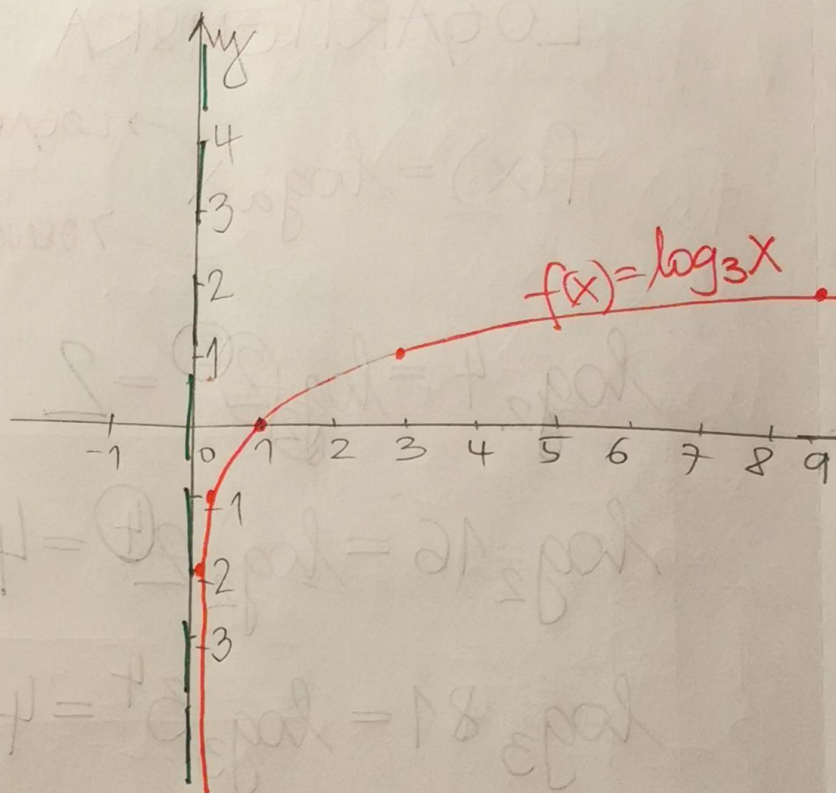
$$f(x) = \log_3 X$$

$$y = 3^x$$

x	y
-2	$3^{-2} = \frac{1}{9}$
-1	$3^{-1} = \frac{1}{3}$
0	$3^0 = 1$
1	$3^1 = 3$
2	$3^2 = 9$

$$y = \log_3 x$$

x	y
$\frac{1}{9}$	-2
$\frac{1}{3}$	-1
1	0
3	1
9	2



LOGARITMSKE ENAČBE

$$\log_2 X = 5$$

$$X = 2^5$$

$$\underline{\underline{X = 32}}$$

$$\log_3 \left(\frac{X}{2} + 1 \right) = 2$$

$$\frac{X}{2} + 1 = 3^2$$

$$\frac{X}{2} + 1 = 9$$

$$\frac{X}{2} = 9 - 1$$

$$\frac{X}{2} = 8 : 2$$

$$\underline{\underline{X = 16}}$$

$$\log_x (4x+5) = 2$$

$$4x+5 = x^2$$

$$-x^2 + 4x + 5 = 0$$

$$a = -1 \quad b = 4 \quad c = 5$$

$$D = b^2 - 4ac$$

$$D = 4^2 - 4 \cdot (-1) \cdot 5$$

$$D = 16 + 20 = \underline{\underline{36}}$$

$$x_1 = \frac{-b + \sqrt{D}}{2a}$$

$$x_2 = \frac{-b - \sqrt{D}}{2a}$$

$$x_1 = \frac{-4 + \sqrt{36}}{2 \cdot (-1)}$$

$$x_2 = \frac{-4 - \sqrt{36}}{2 \cdot (-1)}$$

$$x_1 = \frac{-4 + 6}{-2}$$

$$x_2 = \frac{-4 - 6}{-2}$$

$$x_1 = \underline{\underline{-1}}$$

$$x_2 = \underline{\underline{5}}$$

$$\log_x (5x - 6) = 2$$

$$5x - 6 = x^2$$

$$-x^2 + 5x - 6 = 0$$

$$a = -1 \quad b = 5 \quad c = -6$$

$$D = b^2 - 4ac$$

$$D = 5^2 - 4 \cdot (-1) \cdot (-6)$$

$$D = 25 - 24$$

$$D = 1$$

$$x_1 = \frac{-b + \sqrt{D}}{2a}$$

$$x_2 = \frac{-b - \sqrt{D}}{2a}$$

$$x_1 = \frac{-5 + \sqrt{1}}{2 \cdot (-1)}$$

$$x_2 = \frac{-5 - \sqrt{1}}{2 \cdot (-1)}$$

$$x_1 = \frac{-5 + 1}{-2}$$

$$x_2 = \frac{-5 - 1}{-2}$$

$$x_1 = \underline{\underline{2}}$$

$$x_2 = \underline{\underline{3}}$$

$$\log_{10}(2x+1) = 2$$

$$2x+1 = 10^2$$

$$2x+1 = 100$$

$$2x = 100 - 1$$

$$2x = 99 \quad |:2$$

$$x = 49,5 = \frac{99}{2} \quad \checkmark$$

$$\log(1-x) + \log(1-2x) = \log(1-7x)$$

$$\log(1-x) \cdot (1-2x) = \log(1-7x)$$

$$(1-x)(1-2x) = 1-7x$$

$$1-2x-x+2x^2 = 1-7x$$

$$2x^2 - 2x - x + 7x + 1 - 1 = 0$$

$$2x^2 + 4x = 0$$

$$a=2 \quad b=4 \quad c=0$$

$$D = b^2 - 4ac$$

$$D = 4^2 - 4 \cdot 2 \cdot 0$$

$$D = 16 - 0$$

$$D = \underline{\underline{16}}$$

$$x_1 = \frac{-b + \sqrt{D}}{2a}$$

$$x_2 = \frac{-b - \sqrt{D}}{2a}$$

$$x_1 = \frac{-4 + \sqrt{16}}{2 \cdot 2}$$

$$x_2 = \frac{-4 - \sqrt{16}}{2 \cdot 2}$$

$$x_1 = \frac{-4 + 4}{4}$$

$$x_2 = \frac{-4 - 4}{4}$$

$$x_1 = \frac{0}{4} = \underline{\underline{0}} \quad \checkmark$$

$$x_2 = \underline{\underline{-2}} \quad \checkmark$$

$$\log(3x+1) + \log(x-2) = \log(2x+4)$$

$$\log((3x+1) \cdot (x-2)) = \log(2x+4)$$

$$3x^2 - 6x + x - 2 = 2x + 4$$

$$3x^2 - 6x + x - 2x - 2 - 4 = 0$$

$$3x^2 - 7x - 6 = 0$$

$$a=3 \quad b=-7 \quad c=-6$$

$$D = b^2 - 4ac$$

$$D = (-7)^2 - 4 \cdot 3 \cdot (-6)$$

$$D = 49 + 72$$

$$D = 121$$

$$x_1 = \frac{-b + \sqrt{D}}{2a}$$

$$x_1 = \frac{-(-7) + \sqrt{121}}{2 \cdot 3}$$

$$x_1 = \frac{7 + 11}{6}$$

$$x_1 = \underline{\underline{3}}$$

$$x_2 = \frac{-b - \sqrt{D}}{2a}$$

$$x_2 = \frac{-(-7) - \sqrt{121}}{2 \cdot 3}$$

$$x_2 = \frac{7 - 11}{6}$$

$$x_2 = -\frac{4}{6} = -\frac{2}{3}$$