



Agzamxo'djayeva M.SH

Mavzu:Logarifmik tenglamalar.



Logarifm xossalari



TIAME

$$\log_a (bc) = \log_a b + \log_a c$$

$$\log_a \frac{b}{c} = \log_a b - \log_a c$$

$$\log_a b^r = r \log_a b$$

$$\log_{a^r} b = \frac{1}{r} \log_a b$$

$$\log_a b = \frac{\log_c b}{\log_c a}$$



Ifodalar qiymatlarini hisoblang:



TIAME

$$\log_8 16 + \log_8 4$$

$$\log_3 33 - \log_3 11$$

$$\lg 34 - \lg 3,4$$

$$\lg 25 + \lg 4$$

$$\log_3 \log_3 27$$

$$\log_2 \log_2 16$$

$$\frac{\log_5 49}{\log_5 7}$$

$$\frac{\log_3 64}{\log_3 4}$$



TIIAME

- Ta'rif:*
- Noma'lumli logarifm belgisi ostida qatnashgan
 - tenglama *logarifmik tenglama* deyiladi.

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

$$\log_{f(x)} b = a$$

1-teorema. $\log_a f(x) = \log_a g(x)$ ($a > 0$, $a \neq 1$) tenglama

$$\begin{cases} f(x) = g(x), \\ f(x) > 0 \end{cases} \quad (1)$$

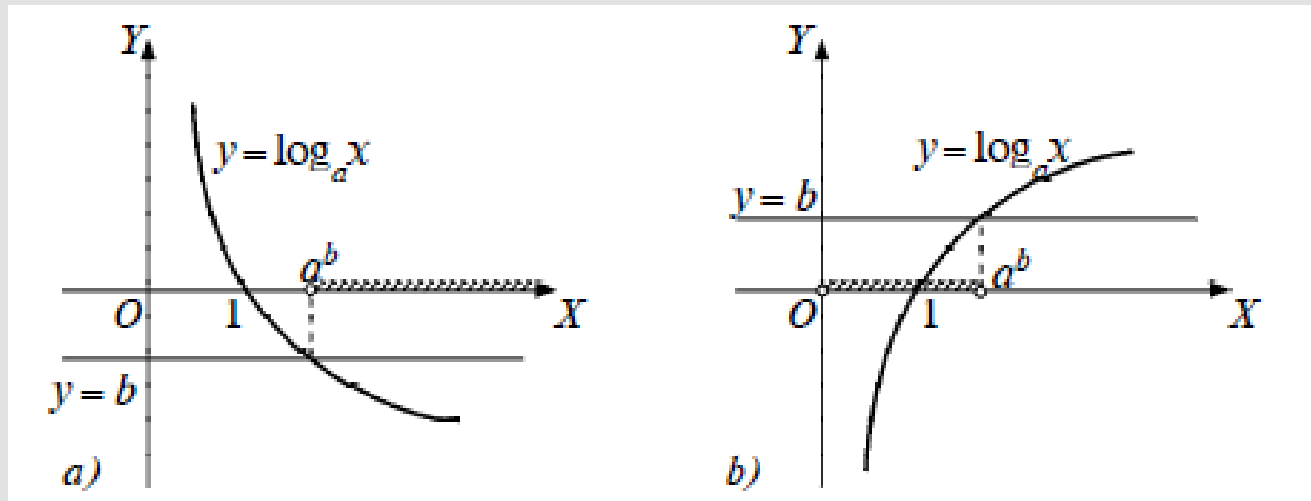
sistemaga teng kuchlidir.



TIAME

$\log_a x = b$ ($a > 0$, $a \neq 1$) tenglamani qaraymiz. Bu tenglama eng sodda logarifmik tenglama deyiladi. $x = a^b$ son qaralayotgan tenglamaning ildizi bo'lishini ko'rish qiyin emas.

Berilgan tenglama $x = a^b$ dan boshqa ildizga ega emasligini $y = \log_a x$ logarifmik funksiyaning monotonligidan foydalanib isbotlash mumkin





TIAME

LT yechish usullari:	Tenglamani turi
1. <u>Logarifm ta'rifini qo'llashga doir</u>	$\log_a f(x) = b$
2. <u>Yangi o'zgaruvchini kiritish usuli</u>	$\log_a^2 f(x) + b \log_a f(x) + c = 0$
3. Bitta asosga keltirish usuli	
4. <u>Potensialashtirish usuli</u>	$\log_a f(x) = \log_a g(x)$
5. Tenglamaning ikkala tomonini logarifmlash usuli	
6. Funktsional-grafik uslubi	$\log_a f(x) = g(x)$



1- misol

$$\log_3^2 x - 5 \log_3 x + 6 = 0$$

Aniqlanish

sohasi : $x > 0$

Belgilaymiz $\log_3 x = t$

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

$$t_1 = 3, t_2 = 2$$

$$1) \log_3 x = 3$$

$$x = 3^3 = 27$$

$$2) \log_3 x = 2$$

$$x = 3^2 = 9$$

Javob : 9;27.



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2- misol

$$\log_2(3x - 5) = 4$$

$$3x - 5 = 2^4$$

$$3x = 16 + 5$$

$$3x = 21$$

$$x = 7$$

3- misol

$$\log_7(3x + 4) = \log_7(5x + 8)$$

$$3x + 4 = 5x + 8$$

$$3x - 5x = 8 - 4$$

$$-2x = 4$$

$$x = -2$$

Tekshirish : $x = -2$ da

tenglamaning chap va o'ng tomonlari
ma'noga ega emas.

Javob : yechimi

yoq



TIAME



4- misol

$$\log_2 x - 2 \log_{\frac{1}{2}} x = 9;$$

Aniqlash

sohasi : $x > 0$

$$\log_2 x - 2 \log_{2^{-1}} x = 9;$$

$$\log_2 x + 2 \log_2 x = 9;$$

$$3 \log_2 x = 9;$$

$$\log_2 x = 3;$$

$$x = 8$$

Javob : $x = 8$

5- misol

$$x^{\log_3 x+1} = 9;$$

Aniqlanish

sohasi : $x > 0, x \neq 1$

Logariflaymiz

$$\log_3 x^{\log_3 x+1} = \log_3 9;$$

$$(\log_3 x + 1) \log_3 x = 2;$$

$$\log_3^2 x + \log_3 x - 2 = 0;$$

$\log_3 x = t$, *belgilaymiz*

$$t^2 + t - 2 = 0;$$

$$t_1 = -2, t_2 = 1;$$

1) $\log_3 x = -2;$

$$x = \frac{1}{9};$$

2) $\log_3 x = 1;$

$$x = 3;$$

Javob : $\frac{1}{9}; 3.$



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