29-Mavzu. Logarifmik tenglama va tengsizliklar

1. $log_{x^2-1}(x^3 - 2x) = log_{x^2-1}(3x^2 + 2x)$ tenglamaning nechta ildizi bor?
   A) 1 B) 2 C) 3 D) 4

2. $5^{lgx} - 3^{lgx-1} = 3^{lgx+1} - 5^{lgx-1}$ tenglamani yeching.
   A) $100; \frac{1}{100}$ B) 100   C) $\frac{1}{100}; 10$ D) 100;1000

3. $2^{2+3\ln x} + 2^{2-3\ln x} = 8$ tenglamani yeching.
   A) 2   B) e C) 0   D) 1

4. $lg(x^2 + 75) = 2\,lg\,2\,x$ tenglamaning barcha ildizlari ko'paytmasini toping.
   A) 2   B) 3   C) 4   D) 5

5. $log_{x-1} x^2 = log_{x-1}(6x - 8)$ tenglamaning ildizlari soni x_0 bo'lsa, $x_0 + 5$ ni toping.
   A) 6   B) 7   C) 8   D) 9

6. $log_{\frac{1}{2}}(-x - 1) + log_{\frac{1}{2}}(1 - x) - log_{\frac{1}{\sqrt{2}}}(7 + x) = 1$ tenglamani yeching.
   A) 17   B) 17; -3   C) -3   D) ildizi yo'q

7. $x^{lg\,25} + 25^{lg\,x} = 50$ tenglamani yeching .
   A) 1   B) 10   C) 5   D) $\sqrt{10}$

8. $log_4^2 x - log_4 \sqrt{x} - 1{,}5 = 0$ tenglamaning eng katta va eng kichik ildizlari nisbatini toping.
   A) 2   B) 16   C) 32   D) 64

9. Tenglamani yeching: $(lg(x + 20) - lg\,x)\,log_x\,0,1 = -1$
   A) 5   B) -4; 5   C) 4   D) -5; 4

10. $|x - 15| \cdot \log_2(x - 3) = 3 \cdot (15 - x)$ tenglama ildizlarining yig'indisini toping.
   A) 26   B) 42   C) 24   D) $29\frac{1}{8}$

11. Tenglama ildizlari yig'indisini toping: $4^{log_4^2(x+2)} + 2(x + 2)^{log_4\sqrt{x+2}} = 8$
   A) $\frac{1}{4}$ B) $\frac{3}{4}$ C) $\frac{5}{4}$ D) $\frac{15}{4}$

12. $|x - 1|^{lg^2 x - lg\,x^2} = |x - 1|^3$ tenglama nechta butun yechimga ega?
   A) 2   B) 3   C) 1   D) 4

13. $3^{\log_3^2 x} + x^{\log_3 x} = 162$ tenglamaning ildizlari ko'paytmasini toping.

   A) 9   B) 3   C) 1   D) $\frac{1}{3}$

14. $(0,8)^x = 4$ tenglama yechimi qaysi oraliqda yotadi?

   A) $(-\infty; -1)$ B) $(0; 1)$ C) $[2; \infty)$ D) $(-1; 0)$

15. $2^x = x^3$ tenglama nechta haqiqiy ildizga ega?

   A) 2   B) 1   C) 3   D) $\varnothing$

16. $3^{-x} = 4 + x - x^2$ tenglamani nechta yechimi bor?

   A) $\varnothing$ B) 1   C) 2   D) 3

17. $2^x + \log_3 x = 9$ tenglamaning ildizi nechta ?

   A) 1   B) 2   C) 3   D) 4

18. $\log_2\log_3\log_4 x = 0$ tenglamani yeching.

   A) 64   B) 16   C) 4   D) 8

19. $\log_{x+1}(2x^2+1)=2$ tenglamaning ildizini toping.

   A) 0   B) 2   C) 1   D) 3

20. $\frac{1}{4^{0,5x}+5} \leq \frac{1}{2^{x+1}-1}$ tengsizlikni yeching

   A) $(-1; \log_2 6)$ B) $(1; \log_2 6)$ C) $(0; \log_2 3)$ D) $(-1;1)$

21. Agar $a = 8$ bo'lsa, ifodani soddalashtiring:

$$\frac{\left(25^{\frac{1}{2\log_{49} 25}} + 2\log_2 \log_2 \log_2 a^{2\log_a 4}\right) \cdot 4^{-\frac{2}{\log_3 4}} - a^2}{1 - a}$$

   A) 4,5   B) 8   C) 9   D) 10

22. $2^{\log_2(x+7)} > 3$ tengsizlikni yeching.

   A) $-7<x<-4$ B) $x>-4$ C) $x\geq-2$ D) $x\geq-3$

23. $4^{\log_4(11-x)} \leq 2$ tengsizlikni yeching

   A) $x\leq 9$ B) $9\leq x<11$ C) $x=9$ D) $9\leq x<10$

24. Tengsizlikni yeching $2\log_8 x - \log_8(x-1) > \frac{2}{3}$

   A) $(2; \infty)$ B) $(3;5)$ C) $(3; \infty)$ D) $(1; 2) \cup (2; \infty)$

25. $y = \sqrt{log_{\frac{1}{3}}(x^2 - 2x) + 1}$ funksiyaning aniqlanish sohasini toping.

    A) $[-1; 3]$ B) $(-\infty; 0) \cup (2; \infty)$ C) $(-\infty; -1] \cup [3; \infty)$ D) $[-1; 0) \cup (2; 3]$

26. Tengsizlikni yeching $log_{\frac{2}{3}} \frac{x}{4} \le log_{\frac{4}{9}}(x - 3)$

    A) $(3; 4] \cup [12; \infty)$ B) $(-\infty; 4] \cup [12; \infty)$

    C) $(0; 3) \cup (3; 4]$ D) $(-\infty; 3) \cup (3; \infty)$

27. $\frac{2 \, log_4 \, x}{2 + log_4 \, x} \le 1$ tengsizlikning yechimlaridan iborat tub sonlarning yig'indisini toping.

    A) 28   B) 17   C) 21   D) 41

28. $log_{0,5}(x + 3)^4 > log_{0,5}(3x - 7)^4$ tengsizlikni yeching .

    A) $(5; \infty)$ B) $(-\infty; -3) \cup (-3; 1) \cup (5; \infty)$

    C) $(-\infty; 1) \cup (1; \infty)$ D) $(-3; 1) \cup (5; \infty)$

29. $\frac{log_{\sqrt{5}} x - 2}{log_{\sqrt{5}} x - 4} \le 0$ tengsizlikning yechimlaridan nechtasi tub sonlardan iborat ?

    A) 5   B) 6   C) 7   D) 8

30. $log_p 10 > log_p 15$ va $log_{4p} 8 > log_{4p} 10$ tengsizliklar o'rinli bo'ladigan p ning barcha qiymatlarini toping .

    A) $0 < p < \frac{1}{4}$ B) $\frac{1}{4} < p < 1$ C) $\frac{1}{5} < p < 1$ D) $p > \frac{1}{4}$

31. $log_{x^2}(3 - 2x) > 1$ tengsizlikning butun yechimlar nechta?

    A) 3   B) 4   C) 1   D) 2

32. $(x - 2)^{log_2(x^2 - 5x + 5)} < (x - 2)^{log_2(x - 3)}$ tengsizlikni yeching

    A) $(3;4)$ B) $(3; \infty)$ C) $(4; \infty)$ D) $\left(\frac{5 + \sqrt{5}}{2}; 4\right)$

33. Tengsizlikni yeching $log_2 \, log_{\frac{1}{3}} \, log_8 \, x > 0$

    A) $(-\infty; 0) \cup (0; 2)$ B) $(1;2)$ C) $(0;2)$ D) $(-\infty; 2)$

34. Tengsizlikni yeching: $log_{0,2}(x^2 - x - 2) > log_{0,2}(-x^2 + 2x + 3)$

    A) $(2; 2,5)$ B) $(1;2)$ C) $(-1; 2,5)$ D) $(-1; 3)$

35. $log_{0,5}(4^x - 5 \cdot 2^x + 6) \ge -1$ tengsizlikning barcha butun yechimlari yig'indisini toping.

    A) 4   B) 3   C) 2   D) 5

36. $log_2^4 x - log_{0,5}^2 \frac{x^3}{8} + 9 \, log_2 \frac{32}{x^2} < 4 \, log_{0,5}^2 x$ tengsizlikning eng katta va eng kichik butun yechimlari ko'paytmasini toping.

A) 40   B) 35   C) 28   D) 21

37. $\frac{8}{3} log_x \frac{10}{x} \geq 2\frac{2}{3} log_x \frac{1}{2}$ tengsizlikning butun yechimlari yig'indisini toping.

A) 200   B) 210   C) 209   D) 199

38. Tengsizlikni yeching: $log_{\frac{1}{3}} \, log_2 \, log_5 (x + 2) > 0$

A) $(-\infty; -2) \cup (23; \infty)$ B) $(-2; \infty)$ C) $(0; 23)$ D) $(3; 23)$

39. $log_5(3 - x) - log_5 12 < 0$ tengsizlikni qanoatlantiradigan butun sonlar nechta?

A) cheksiz   B) 12   C) 10   D) 11

40. $log_{x^2}(3 - 2x) > 1$ tengsizlikni qanoatlantiradigan butun sonlar nechta?

A) 4   B) 3   C) 2   D) 1

41. $3^{lgx+2} < 3^{lgx^2+5} - 2$ tengsizlikni yeching.

A) $(1; \infty)$ B) $\left(\frac{1}{10}; \infty \right)$ C) $(\frac{1}{100}; \infty)$ D) $(0; \infty)$

42. $log_3(4,5 - 2x)(12 + x - x^2) \geq 0$ tengsizlikning butun yechimlari yig'indisini toping.

A) –5   B) –2   C) 2   D) 5

43. $(x - 5)^{log_{\frac{1}{2}}(x^2-5x+6)} > (x - 5)^{log_{\frac{1}{2}}(x-3)}$ tengsizlikni yeching.

A) $(2; 5)$ B) $(2; 3)$ C) $(5; 6)$ D) $(3; 6)$

44. $log_{\sqrt{11}-\sqrt5}\left(x^2 + 2x + 16 - 2\sqrt{55}\right) < 2$ tengsizlikning butun yechimlari sonini toping.

A) 1   B) 2   C) 3   D) 4

45. x va y butun sonlar $lg(3x - 2y + 4) + lg(2y - 2 - 3x) > y^2 - 6y + 5$ tengsizlikni qanoatlantiradi. $x + y$ ni toping.

A) –1   B) 0   C) 2   D) 4

Kalitlar

1.	A	16.	C	31.	D
2.	B	17.	A	32.	A
3.	D	18.	A	33.	B
4.	D	19.	B	34.	A
5.	D	20.	A	35.	C
6.	C	21.	C	36.	B
7.	B	22.	B	37.	C
8.	C	23.	B	38.	D
9.	A	24.	D	39.	D
10.	A	25.	D	40.	C
11.	A	26.	A	41.	C
12.	A	27.	D	42.	A
13.	C	28.	B	43.	C
14.	A	29.	C	44.	A
15.	A	30.	A	45.	D