## 27-Mavzu. Ko'rsatkichli tenglama va tengsizliklar

**1.** $\left(\frac{1}{8} \cdot 4^x\right)^x - \frac{8^x}{16} = 0$ tenglama ildizlarining o'rta arifmetigini toping.

A) 2,5 B) 3 C) 1,5 D) 2

**2.** Tenglama ildizlari yig'indisini toping.

$$\frac{2^{5\sqrt[3]{x}}}{2^{\sqrt[3]{x^2}+2,6}} = 8\sqrt[5]{4}$$

A) –35    B) 35    C) –5    D) 5

**3.** $3^1 \cdot 3^2 \cdot 3^3 \cdot \ldots \cdot 3^x = \frac{1}{9^{-18}}$ tenglamani yeching.

A) 8    B) 8 va –9    C) –9 va 8    D) 12

**4.** $2^{|x-7|+2x-4} = 64$ tenglamani yeching.

A) 3    B) 1,5    C) 2    D) 1

**5.** $4\sqrt[3]{0{,}125^{x-3}} = 2^{\sqrt{x+1}}$ tenglamani yeching.

A) $3;\frac{1}{2}$    B) $3;\frac{1}{3}$    C) 3    D) 3;2

**6.** $3^x + 4^x + 5^x = 6^x$ tenglamaning ildizi qaysi oraliqda yotadi?

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

**7.** $\left(\left(\sqrt[5]{7^3}\right)^{\frac{x}{4}-\sqrt{\frac{x}{3}}}\right)^{\frac{x}{4}+\sqrt{\frac{x}{3}}} = \sqrt[4]{7^7}$ tenglamaning katta ildizini ildizlar soniga nisbatini toping.

A) 10    B) 5    C) $\frac{8}{3}$    D) $\frac{11}{3}$

**8.** $2^{2^{2^{2^2}}} = 4^{4^x}$ tenglamani yeching.

A) 4    B) 7,5    C) 3,5    D) 8

**9.** $3^{\frac{2x+8}{x+2}} - 5 \cdot 3^{\frac{2x+6}{x+2}} + 54 = 0$ tenglamaning ildizlari ko'paytmasini toping.

A) –1    B) 0    C) 2    D) 1

**10.** $(2x - 5)^{2x^2-x} = (2x - 5)^{14x-28}$ tenglama nechta yechimga ega?

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

**11.** $\left(\sqrt{x} + 2\right)^{10x^2 - 3x - 1} = 1$ tenglamaning ildizlari yig'indisini toping.

   A) 0,3    B) 0,5    C) 0,1    D) 0,7

**12.** $x^{x^2 - x - 6} = 1, (x > 0)$ tenglamaning ildizlari yig'indisini toping.

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

**13.** $|x^2 - x - (x + 1)|^{x - 7} = |x^2 - 2x - 1|$ tenglamaning nechta ildizi bor?

   A) 2    B) 3    C) 5    D) 6

**14.** $x^{\sqrt{x}} = \sqrt{x^x}$ tenglamaning ildizlari yig'indisini toping.

   A) 5    B) 10    C) 4    D) 11

**15.** $x^{x+1} = x$ tenglama nechta yechimga ega ?

   A) 1    B) 2    C) 3    D) ildizi yo'q

**16.** $2^{x^2 + 1} = 1 - x^8$ tenglamani yeching.

   A) 1    B) tenglama ildizga ega emas    C) –1    D) 2

**17.** $(1 - x)^2 + 12 = 2^{(x-1)^2}$ tenglamaning ildizlari sonini toping.

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

**18.** Agar $\begin{cases} 3^x = 9^{y+1} \\ 4y = 5 - x \end{cases}$ ekanligi ma'lum bo'lsa, $x+y$ ning qiymatini toping.

   A) 3,5    B) 4    C) –2,5    D) 3

**19.** Tenglamalar sistemasini yeching $\begin{cases} x^{y+1} = 27 \\ x^{2y-5} = \frac{1}{3} \end{cases}$

   A) (2;3)    B) (2;4)    C) (4;2)    D) (3;2)

**20.** $\begin{cases} 2^x + 2^y = 5 \\ 2^{x+y} = 4 \end{cases}$   $x \cdot y = ?$

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

**21.** $a$ ning qanday qiymatida $2^{4x} \cdot 4^a = 32$ va $3^x \cdot 3^a = 27$ tenglamalarning ildizlari bir-biriga teng bo'ladi ?

   A) 2,5    B) 3    C) 3,5    D) 1,5

**22.** Tenglamalar sistemasini yeching:
$$\begin{cases} x \cdot 2^x - y \cdot 4^y = x \cdot 4^y - y \cdot 2^x \\ 3^x \cdot 9^y = 81 \end{cases}$$
A) $(-4; -4), (2; 1)$     B) $(-4; 4), (-2; 1)$
C) $(-4; 4), (2; 1)$      D) $(4; -4), (-2; -1)$

**23.** Tenglamalar sistemasini yeching:
$$\begin{cases} 2^x - 3^y = 1 \\ 2^{x+2} - 3^{y+1} = 7 \end{cases}$$
A) $(2; -1)$    B) $(2; 1), (-2; -1)$    C) $(2; 1)$    D) $(2; 1), (1; 2)$

**24.** Tenglamalar sistemasini yeching:
$$\begin{cases} x^{13} = 12^y \\ x^2 - 11x - 12 = 0 \end{cases}$$
A) $(12; 13)$         B) $(12; 13), (-12; -13)$
C) $(-12; -13)$      D) $(12; 13), (13; 12)$

**25.** Agar $2^a = 5$ va $20^b = 625$ bo'lsa, $a$ ni $b$ orqali ifodalang.
A) $\frac{2b}{3-b}$    B) $\frac{2b}{4-b}$    C) $\frac{2b}{4+b}$    D) $\frac{3-b}{b}$

**26.** Agar $5^a = 36$, $6^b = 625$ bo'lsa, $a \cdot b$ ning qiymatini toping.
A) 8    B) 10    C) 11    D) 13

**27.** Agar $a, b, c > 0$ va $a^b = 81$, $b^c = 2$, $a^c = 3$ bo'lsa, $(4c)^c$ ni toping.
A) 2    B) 8    C) 3    D) 4

**28.** $a > 0, a^n - \frac{8}{a} = \frac{1}{a}$ berilgan. $a^{\frac{n+1}{2}}$ ni toping.
A) 1    B) 2    C) 3    D) 4

**29.** $a$ ning qanday qiymatida $a(2^x + 2^{-x}) = 5$ tenglama yagona yechimga ega?
A) $-\frac{5}{2}$    B) $-\frac{2}{5}$    C) $2,5$    D) $\frac{2}{5}$

**30.** $a$ parametrning qanday qiymatlarida $\frac{9^x - 2(a+1) \cdot 3^x + 2a + 1}{x^2 - x} = 0$ tenglama yagona yechimga ega?
A) $(-0,5; \infty)$ B) $(0;1) \cup (1; \infty)$ C) $(-0,5;0) \cup (0;1) \cup (1; \infty)$ D) $(-\infty;0) \cup (0;1) \cup (1; \infty)$

**31.** $f(x) = \sqrt{3^x - 4^x}$ funksiyaning aniqlanish sohasini toping.
A) $(-\infty;0]$    B) $(0;1)$    C) $[0;1)$    D) $[0; \infty)$

**32.** Tengsizlikni yeching $2^{\sqrt{x}-1} \cdot (4x^2 - 4x + 1) > 0$
   A) $(1; \infty)$    B) $[0; \infty)$    C) $(-\infty;\infty)$    D) $[0;0,5)\cup(0,5; \infty)$

**33.** $(1,25)^{1-x} > (0,64)^{2(1+\sqrt{x})}$ tengsizlikning yechimlari orasida nechta tub son bor?
   A) 5    B) 7    C) 9    D) cheksiz ko'p

**34.** $x^2 \cdot 3^x - 3^{x+1} \leq 0$ tengsizlikning butun sonlardan iborat yechimlari nechta?
   A) 1    B) 2    C) 3    D) cheksiz ko'p

**35.** $\frac{1}{8} \cdot 2^{4x-2} > (\sqrt{2})^{10}$ tengsizlikni qanoatlantiruvchi eng kichik butun sonni toping.
   A) 4    B) 3    C) 2    D) 1

**36.** $4^x - 5 \cdot 2^{x+1} + 16 \leq 0$ tengsizlikni yeching
   A) $(0;1)\cup(3; \infty)$ B) $(1;3)$ C) $[1;3]$ D) $[0;1]\cup(3; \infty)$

**37.** Tengsizlikni yeching $2^x + 2^{1-x} > 3$
   A) $(0;1)$    B) $(-\infty;0)\cup(1; \infty)$    C) $(1; \infty)$    D) $[0;1]$

**38.** $2^{\sqrt{x+1}} - 6 < 2^{4-\sqrt{x+1}}$ tengsizlikni qanoatlantiruvchi eng kata va eng kichik butun sonlar ayirmasini toping.
   A) 7    B) 6    C) 9    D) 8

**39.** $0,1^{x+1} < 0,8 + 2 \cdot 10^x$ tengsizlikni qanoatlantiruvchi eng kichik butun sonni toping.
   A) –2      B) –1      C) 0      D) 1

**40.** $2^x + 2^{-x} < 3$ tengsizlikni nechta butun son qanoatlantiradi?
   A) 1 ta    B) 2 ta    C) 3 ta    D) 4 ta

**41.** $\sqrt{9^x + 3^x - 2} \geq 9 - 3^x$ tengsizlikni qanoatlantiradigan eng kichik butun sonni toping.
   A) 1    B) 2    C) 3    D) 4

**42.** $\sqrt{9^x - 3^{x+2}} > 3^x - 9$ tengsizlikni yeching
   A) $(-\infty; 2)$    B) $(2; 9)$    C) $(2; 32)$    D) $(2; \infty)$

**43.** $4^x - 2 \cdot 5^{2x} - 10^x > 0$ tengsizlikni qanoatlantiradigan eng katta butun sonni toping.

A) 0    B)$-1$    C)$-2$    D)1

**44.** $x^2 2^{2x} + 9(x+2)2^x + 8x^2 \leq (x+2)2^{2x} + 9x^2 \cdot 2^x + 8x + 16$ tengsizlikni qanoatlantiruvchi nechta butun son bor?

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

**45.** $a$ ning qanday qiymatlarida $3^{\sqrt{x}} > 2^a$ tengsizlikning yechimi $[0; \infty)$ bo'ladi?

A) $a<0$    B) $a>0$    C) $a>1$    D) $a<1$

**46.** Nechta nomusbat butun son $2^{2-x} \leq x^2 - 4x + 5$ tengsizlikni qanoatlantiradi?

A) 1 ta    B) 2 ta    C) 3 ta    D) cheksiz ko'p

**47.** $3^{\frac{1}{x}+3} + 9^{\frac{1}{2x}} > 84$ tengsizlikni yeching.

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

**48.** $|x+5|^{x^2-1} \geq 1$ tengsizlikni yeching.

A) $(-\infty; -6] \cup [-4; -1] \cup [1; \infty)$    B) $[-6; -4] \cup [-1; 1]$
C) $(-\infty; -6] \cup [-4; -1) \cup (1; \infty)$    D) $[-6; -4] \cup (-1; 1)$

**49.** $(x-1)^{x^2-25} > 1$ tengsizlikni yeching.

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

**50.** $3^{2x} \cdot x^2 + 5x - 6 \leq x^2 + 5x \cdot 3^{2x} - 2 \cdot 3^{2x+1}$ tengsizlikning eng katta manfiy butun yechimini eng katta musbat butun yechimiga nisbatini toping.

A) $-\frac{1}{3}$    B) $\frac{3}{2}$    C) $\frac{2}{3}$    D) $-3$

# Kalitlar

| 1. | C | 16. | B | 31. | A | 46. | C |
|---|---|---|---|---|---|---|---|
| 2. | B | 17. | C | 32. | D | 47. | A |
| 3. | A | 18. | A | 33. | C | 48. | A |
| 4. | A | 19. | D | 34. | C | 49. | A |
| 5. | C | 20. | A | 35. | B | 50. | A |
| 6. | D | 21. | C | 36. | C | | |
| 7. | A | 22. | C | 37. | B | | |
| 8. | B | 23. | B | 38. | C | | |
| 9. | B | 24. | A | 39. | C | | |
| 10. | B | 25. | B | 40. | A | | |
| 11. | B | 26. | A | 41. | B | | |
| 12. | A | 27. | A | 42. | D | | |
| 13. | C | 28. | C | 43. | B | | |
| 14. | A | 29. | C | 44. | D | | |
| 15. | B | 30. | C | 45. | A | | |