

Задание # 015

Решите неравенство:

3.1. $\log_{\sqrt{2x^2-7x+6}}\left(\frac{x}{3}\right) > 0;$

3.2. $(4^{x^2-x-6} - 1) \cdot \log_{0,25}(4^{x^2+2x+2} - 3) \leq 0;$

3.3. $x \cdot \log_{x+3}(2x + 7) \geq 0;$

3.4. $\frac{3^x-1}{3^x-3} \leq 1 + \frac{1}{3^x-2};$

3.5. $\frac{2x^2+9x+7}{\log_3(x^2+6x+9)} \geq 0;$

3.6. $\frac{2x^2+3x-5}{\log_5(x^2+4x+4)} \geq 0;$

3.7. $\frac{35^{|x|}-5^{|x|}-5 \cdot 7^{|x|}+5}{2\sqrt{x+2}+1} \geq 0;$

3.8. $\frac{\log_2(8x) \cdot \log_3(27x)}{x^2-|x|} \leq 0;$

3.9. $\frac{3^{x^2+x}-4(\sqrt{3})^{x^2+x}+3}{\sqrt{x}-\sqrt{x+4}} \leq 0;$

3.10. Решите систему неравенств:

$$\begin{cases} 4^x - 2^{x+1} - 3 \geq 0 \\ \log_{0,5}\left(\frac{x^2}{x-1} - 4\right) \geq \frac{\log_{2,5}(x^2-x\sqrt{12}+3)}{\log_{0,4}(3-2\sqrt{3x^2+x^2})} \end{cases}$$

3.11. $1 + \frac{11}{2^x-8} + \frac{28}{4^x-2^{x+4}+64} \geq 0;$

3.12. $1 + \frac{14}{3^x-9} + \frac{48}{9^x-2 \cdot 3^{x+2}+81} \geq 0;$

$$3.13. \frac{5\log_2^2 x - 100}{\log_2^2 x - 25} \geq 4;$$

$$3.14. \frac{\log_2(2x^2 - 17x + 35) - 1}{\log_7(x + 6)} \leq 0;$$

$$3.15. \log_6(64^x + 36^x - 65 \cdot 8^x + 64) \geq 2x;$$

$$3.16. \log_3(81^x + 16^x - 18 \cdot 4^x + 32) \geq 4x;$$

$$3.17. \log_3^2(25 - x^2) - 3\log_3(25 - x^2) + 2 \geq 0;$$

$$3.18. \frac{\log_4(64x)}{\log_4 x - 3} + \frac{\log_4 x - 3}{\log_4(64x)} \geq \frac{\log_4 x^4 + 16}{\log_4^2 x - 9};$$

$$3.19. \frac{\log_4(16x^4) + 11}{\log_4^2 x - 9} \geq -1;$$

$$3.20. \frac{\log_3(9x) - 13}{\log_3^2 x + \log_3 x^4} \leq 1;$$

$$3.21. \frac{\log_6(36x) - 1}{\log_6^2 x + \log_6 x^3} \geq 0;$$

$$3.22. \frac{(\log_4 x + 2)^2}{\log_4^2 x - 9} \geq 0;$$

$$3.23. 1 + \frac{10}{\log_2 x - 5} + \frac{16}{\log_2^2 x - \log_2(32x^{10}) + 30} \geq 0;$$

$$3.24. \frac{\log_3 x}{\log_3(\frac{x}{27})} \geq \frac{2}{\log_3 x} + \frac{5}{\log_3^2 x - \log_2 x^3};$$

$$3.25. \frac{\log_5(5x - 27)}{\log_5(x - 5)} \geq 1;$$

$$3.26. (9^x - 2 \cdot 3^x)^2 - 62(9^x - 2 \cdot 3^x) - 63 \geq 0;$$

$$3.27. 9^x + 3^{x+1} + 3^{1-x} + \frac{1}{9^x} \leq 8;$$

$$3.28. \frac{3^x + 9}{3^x - 9} + \frac{3^x - 9}{3^x + 9} \geq \frac{4 \cdot 3^{x+1} + 144}{9^x - 81};$$

$$3.29. \frac{2^x+8}{2^x-8} + \frac{2^x-8}{2^x+8} \geq \frac{2^{x+4}+96}{4^x-64};$$

$$3.30. \frac{2 \cdot 8^{x-1}}{2 \cdot 8^{x-1} - 1} \geq \frac{3}{8^{x-1}} + \frac{8}{64^x - 5 \cdot 8^x + 4};$$

$$3.31. \frac{8^{x+1} - 40}{2 \cdot 64^x - 32} \leq 1;$$

$$3.32. \frac{3^x}{3^x - 3} + \frac{3^x + 1}{3^x - 2} + \frac{5}{9^x - 5 \cdot 3^x + 6} \leq 0;$$

$$3.33. 9^{4x-x^2-1} - 36 \cdot 3^{4x-x^2-1} + 243 \geq 0;$$

$$3.34. \frac{1}{3^x-1} + \frac{9^{x+\frac{1}{2}} - 3^{x+3} + 3}{3^x-9} \geq 3^{x+1};$$

$$3.35. 4 \cdot 4^{x^2+2x-5} - 33 \cdot 2^{x^2+2x-5} + 8 \geq 0;$$

$$3.36. \frac{9^x + 2 \cdot 3^x - 117}{3^x - 27} \leq 1;$$

$$3.37. \frac{25^{x^2+x-10} - (0,2)^{x^2-2x-7} - 117}{0,5 \cdot 4^{x-1} - 1} \leq 0;$$

$$3.38. \log_{0,5}(10 - 10x) \leq \log_{0,5}(x^2 - 5x + 4) + \log_{0,5}(x + 3);$$

$$3.39. \log_3(9 - 9x) > \log_3(x^2 - 3x + 2) + \log_3(x + 4);$$

$$3.40. \log_{\frac{1}{3}}((4-x)(x^2+29)) \leq \log_{\frac{1}{3}}(x^2-10x+24) + \log_{\frac{1}{3}}(7-x);$$

$$3.41. \log_3(4 - 4x) \geq \log_3(x^2 - 4x + 3) + \log_3(x + 2);$$

$$3.42. \log_2((x-1)(x^2+2)) \leq 1 + \log_2(x^2+3x-4) - \log_2 x;$$

$$3.43. 3 \cdot 45^x - 3 \cdot 27^x - 28 \cdot 15^x + 28 \cdot 9^x + 9 \cdot 5^x - 3^{x+2} \leq 0$$

$$3.44. 45^x - 27^x - 18 \cdot 15^x + 2 \cdot 9^{x+1} + 81 \cdot 5^x - 3^{x+4} \leq 0$$

$$3.45. 16^{\frac{1}{x}-1} - 4^{\frac{1}{x}-1} - 2 \geq 0$$

$$3.46. (25^x - 4 \cdot 5^x)^2 + 8 \cdot 5^x < 2 \cdot 25^x + 15$$

$$3.47. (9^x - 3^{x+1})^2 + 8 \cdot 3^{x+1} < 8 \cdot 9^x + 20$$

$$3.48. \frac{5^x}{5^{x-4}} + \frac{5^{x+5}}{5^{x-5}} + \frac{22}{25^x - 9 \cdot 5^x + 20} \leq 0$$

$$3.49. \log_5((3-x)(x^2+2)) \geq \log_5(x^2-7x+12) + \log_5(5-x)$$

$$3.50. \log_3((2-x)(x^2+5)) \geq \log_3(x^2-5x+6) + \log_3(4-x)$$

$$3.51. x^2 \cdot \log_{243}(4-x) \leq \log_3(x^2-8x+16)$$

$$3.52. \log_3(x+7) + \frac{1}{6} \log_3(x+1)^6 \geq 2$$

$$3.53. \log_9(x-7)^2 \cdot \log_{81}(x-3)^4 + \log_3 \frac{(x-3)^3}{x-7} \geq 3$$

$$3.54. \frac{1}{\log_3 x + 4} + \frac{2}{\log_3(3x)} \cdot \left(\frac{2}{\log_3 x + 4} - 1 \right) \leq 0$$

$$3.55. \frac{2}{9-3^x} \leq \frac{8}{3-3^x}$$

$$3.56. 4^{\frac{2}{x}} + 3 \geq 4^{\frac{1+x}{x}};$$

$$3.57. 98^x - 2 \cdot 14^x - 70^x + 2 \cdot 10^x \geq 0;$$

$$3.59. 4 \cdot 4^{x^2+2x-5} - 33 \cdot 2^{x^2+2x-5} + 8 \geq 0;$$

$$3.60. \frac{2}{3^{x+27}} \geq \frac{1}{3^{x-27}};$$

$$3.61. 3^x - \frac{702}{3^{x-1}} \geq 0;$$

$$3.62. 3^x - \frac{243}{3^{x-36}} \geq 0;$$

$$3.63. \frac{2 \cdot 3^x - 10 \cdot 3^{2-x}}{3^x - 3^{2-x}} \geq 1;$$

$$3.64. \frac{4^x + 7 \cdot 2^x - 48}{2^x - 32} \leq 1;$$

$$3.65. 1 + \frac{6}{\log_3 x - 3} + \frac{5}{\log_3^2 x - \log_3(27x^6) + 12} \geq 0$$

$$3.66. \log_{25}((x-4)(x^2-2x-8)) \geq 0,5 \log_5(x-4)^2$$

$$3.67. \log_{0,1}(x^3 - 5x^2 - 25x + 125) \leq \log_{0,01}(x-5)^4$$

$$3.68. \log_{27}(x^3 - 9x^2 + 27x - 27) \geq \log_3(x^2 - 9) - 4$$

$$3.69. \log_3^2(x-4) - \log_3^2(x-6) \leq 0$$

$$3.70. \frac{\log_2(32x) - 1}{\log_2^2 x - \log_2 x^5} \geq -1$$

$$3.71. \log_2 x + 2 \log_x 2 \geq \frac{3}{(\log_2 x)^3}$$

$$3.72. \frac{45}{(\log_2^2 x + 6 \log_2 x)^2} + \frac{14}{\log_2^2 x + 6 \log_2 x} + 1 \geq 0$$

$$3.73. \frac{1}{(\log_3 x + 1)^2} \leq (\log_{\sqrt{3}} x)^2 + \log_3 x^4 + 1$$

$$3.74. \frac{\log_3(3-x) - \log_3(x+2)}{\log_3^2(x^2) + \log_3(x^4) + 1} \geq 0$$

$$3.75. \frac{\log_2(x^2) - \log_3(x^2)}{\log_6^2(2x^2 - 10x + 12,5) + 1} \geq 0$$

$$3.76. \frac{\log_3 x}{\log_3 \frac{x}{27}} \geq \frac{2}{\log_3 x} + \frac{5}{\log_3^2 x - \log_3 x^3}$$

$$3.77. (\log_{0,25}^2(x+3) - \log_4(x^2 + 6x + 9) + 1) \cdot \log_4(x+2) \leq 0$$