

Solving Exponential and Logarithmic Inequalities WKST

Solve the inequality. State the answers in set notation.

1. $6^{3x} < 35$

3. $3^{2x-1} \geq \frac{1}{243}$

5. $2^x \geq \sqrt{3^{x-1}}$

7. $\log_4 x \geq 4$

9. $\frac{1}{\ln x + 1} \leq 1$

11. $\log(8x^3) > 3$

13. $\log_5(x) + \log_5(3x-11) > \log_5(4)$

15. $\ln x + \ln(x-3) \geq \ln 28$

2. $3^{x-1} \leq 4^x$

4. $3 \cdot 2^{2x} - 2 \cdot 2^x - 8 \leq 0$

6. $\left(\frac{25}{81}\right)^{2x+1} \leq \left(\frac{729}{125}\right)^{-3x+1}$

8. $\log_2 x \leq -2$

10. $\log_7(x+2) \geq \log_7(6x-3)$

12. $x \ln x - x \leq 0$

14. $\ln(x-3)^3 > 15$

16. $\ln(x+1)^2 \leq 2$

ANSWERS

1. $\left\{x \mid x < \frac{1}{3} \log_6 35\right\}$

3. $\{x \mid x \geq -2\}$

5. $\left\{x \mid x \geq \frac{\log 3}{\log 3 - \log 4}\right\}$

7. $\{x \mid x \geq 256\}$

9. $\{x \mid x \geq 1\}$

11. $\{x \mid x > 5\}$

13. $\{x \mid x > 4\}$

15. $\{x \mid x \geq 7\}$

2. $\left\{x \mid x \leq \frac{\log 3}{\log 3 - \log 4}\right\}$

4. $\{x \mid x \leq 1\}$

6. $\{x \mid x \geq 1\}$

8. $\left\{x \mid 0 < x \leq \frac{1}{4}\right\}$

10. $\left\{x \mid \frac{1}{2} < x \leq 1\right\}$

12. $\{x \mid 0 < x \leq e\}$

14. $\{x \mid x > e^5 + 3\}$

16. $\{x \mid x < -1 \text{ or } -1 < x \leq e-1\}$