

4.5 WS 4

Solve the following equations. Be sure to check your answers.

1. $3^{x-1} = 81$

2. $8^x = 4$

3. $-14 + 3e^x = 11$

4. $\log(3x+1) = 2$

5. $-6 + \ln 3x = 0$

6. $\ln x - \ln 3 = 4$

7. $\log_2 x + \log_2(x-3) = 2$

8. $2\log_6 4x = 0$

9. $\log x - \log 6 = 2\log 4$

10. $\log_2 2x = \log_2 100$

11. $2\log_4 x - \log_4(x-1) = 1$

12. $2e^{2x} - 5e^x - 3 = 0$

Find the inverse of each function, then state the domain and range of $f^{-1}(x)$.

13. $f(x) = 3x - 12$

14. $g(x) = \sqrt{7-x}$

15. $f(x) = \frac{x}{x-5}$

Use the properties of logarithms to expand the following logarithmic expressions. Assume all variable expressions represent positive real numbers. When possible, evaluate logarithmic expressions.

16. $\log\left(\frac{100x\sqrt{y}}{z^3}\right)$

17. $\ln\left(ex^3y\right)^2$

18. $\ln\sqrt{x\sqrt{yz^3}}$