Solving Exponential and Logarithmic Functions Worksheet

In 1-9, solve each exponential equation. Where necessary, give the exact value and then use a calculator to obtain a decimal approximation, correct to four decimal places.

1. $2^{4x-2} = 64$
2. $125^{x} = 25$
3. $9^{x+2} = 27^{-x}$
4. $8^{x} = 12{,}143$
5. $9e^{5x} = 1269$
6. $e^{12-5x} - 7 = 123$
7. $5^{4x+2} = 37{,}500$
8. $3^{x+4} = 64$
9. $16^{4x-2} = \frac{1}{64}$

In 10-18, solve each logarithmic equation. Check for extraneous solutions.

10. $\log_4(3x-5) = 3$
11. $3 + 4\ln(2x) = 15$
12. $\log_2(x+3) + \log_2(x-3) = 4$
13. $\log_3(x-1) - \log_3(x+2) = 2$
14. $\ln(x+4) - \ln(x+1) = \ln x$
15. $\log_4(2x+1) = \log_4(x-3) + \log_4(x+5)$
16. $2\ln(3x) = 8$
17. $\log x + \log(x+15) = 2$
18. $\ln(x-4) - \ln(x+1) = \ln 6$

In 19-21, evaluate the expression.

19. $3\ln e + 5\log 100$
20. $3^2 - 3\log_2 8$
21. $\ln e + \log 10 + \log 1 + \ln 1$

In 22-23, graph the exponential function. Show the parent function and then graph the give function. State the domain, range and the equation of asymptote of the given function.

22. $y = -2(3)^{x-3} + 4$
23. $y = \left(\frac{1}{3}\right)^{x-1} - 4$