NAME _____ DATE _____ PERIOD ____

9-5 Practice

Base e and Natural Logarithms

Use a calculator to evaluate each expression to four decimal places.

1. $e^{1.5}$
2. $\ln 8$
3. $\ln 3.2$
4. $e^{-0.6}$
5. $e^{4.2}$
6. $\ln 1$
7. $e^{-2.5}$
8. $\ln 0.037$

Write an equivalent exponential or logarithmic equation.

9. $\ln 50 = x$
10. $\ln 36 = 2x$
11. $\ln 6 \approx 1.7918$
12. $\ln 9.3 \approx 2.2300$
13. $e^x = 8$
14. $e^5 = 10x$
15. $e^{-x} = 4$
16. $e^2 = x + 1$

Evaluate each expression.

17. $e^{\ln 12}$
18. $e^{\ln 3x}$
19. $\ln e^{-1}$
20. $\ln e^{-2y}$

Solve each equation or inequality.

21. $e^x < 9$
22. $e^{-x} = 31$
23. $e^x = 1.1$
24. $e^x = 5.8$
25. $2e^x - 3 = 1$
26. $5e^x + 1 \geq 7$
27. $4 + e^x = 19$
28. $-3e^x + 10 < 8$
29. $e^{3x} = 8$
30. $e^{-4x} = 5$
31. $e^{0.5x} = 6$
32. $2e^{5x} = 24$
33. $e^{2x} + 1 = 55$
34. $e^{3x} - 5 = 32$
35. $9 + e^{2x} = 10$
36. $e^{-3x} + 7 \geq 15$
37. $\ln 4x = 3$
38. $\ln (-2x) = 7$
39. $\ln 2.5x = 10$
40. $\ln (x - 6) = 1$
41. $\ln (x + 2) = 3$
42. $\ln (x + 3) = 5$
43. $\ln 3x + \ln 2x = 9$
44. $\ln 5x + \ln x = 7$

INVESTING For Exercises 45 and 46, use the formula for continuously compounded interest, $A = Pe^{rt}$, where P is the principal, r is the annual interest rate, and t is the time in years.

45. If Sarita deposits \$1000 in an account paying 3.4% annual interest compounded continuously, what is the balance in the account after 5 years?

46. How long will it take the balance in Sarita's account to reach \$2000?

47. **RADIOACTIVE DECAY** The amount of a radioactive substance y that remains after t years is given by the equation $y = ae^{kt}$, where a is the initial amount present and k is the decay constant for the radioactive substance. If $a = 100$, $y = 50$, and $k = -0.035$, find t.