

Review

SM3 9.5-9.8 Test Review

Name _____ Date _____ Period _____

Evaluate the logarithm without a calculator. Show work!

1. $\log_6\left(\frac{1}{36}\right)$

2. $10^{\log 5}$

3. $\log 1000$

4. $\log_{21} \sqrt{21}$

5. $\ln \frac{1}{\sqrt{e}}$

6. $\log_7 343$

7. $\log_6 6^2$

8. $e^{\ln 20}$

9. $\log_8 \frac{1}{64}$

10. $\ln e$

11. $\log_{12} 1$

Find the following using a calculator. Round to the nearest ten thousandths.

12. $\log 32$

13. $\ln 0.98$

14. $\log(-3)$

15. $5^{3.2}$

Rewrite as an exponential function.

16. $\log x = 4$

17. $\ln 5 = x$

18. $\log_3 243 = 5$

Rewrite as a logarithmic function.

19. $5^4 = 625$

20. $10^x = 100$

21. $e^2 = x$

Solve each function by making the bases the same. DO NOT use logarithms!

22. $2^{3x} = 8$

23. $3^{2x-1} = 3^5$

Expand the following logarithms.

24. $\log_2\left(\frac{5x}{y}\right)$

25. $\log_8\left(\frac{2x-3}{x^4}\right)$

Condense the following logarithms.

26. $\log_3 6 - \log_3 a$

27. $4\log x + 2\log y$

28. $2\log_4 3 + \log_4(x-5) - 7\log_4 x$

Write the change of base rule to find the logarithm to the nearest ten thousandths.

29. $\log_{3.4} 210$

30. $\log_4 3.8$

Solve each equation. Show work. Round to the nearest thousandths if necessary.

31. $\log_4 x = \frac{1}{2}$

32. $\log_5(x-4) - \log_5 5 = 2$

33. $\log_2(x+2) = 5$

34. $\log_4(4x) + \log_4(x) = 4$

35. $-10^{x-2} + 8 = -20$

36. $\log_5 4x = \log_5 10$

Solve the following exponentials for x. Hint: Rewrite as a log and solve for x.

37. $5^{x-10} = 9$

38. $5 \cdot 3^{2-x} - 6 = 34$

39. $e^{x-3} = 29$

40. If you have \$15,000 to invest at 4.75% per annum how much will you have after 5 years if the money is compounded continuously.

41. How much will result if you invest \$10,000 for 3 years at an interest rate of 10% if the money is compounded quarterly?

42. Which will have the highest result compounding daily or compounding continuously \$5000 at 7.3% for 2 years? What would each of the results be?

For problems 43-45, the population, P , of a growing city at time t (in years) obeys the function $P(t) = 500000e^{.08t}$.

43. What is the initial size of the city?

44. Is the exponential function a growth or decay? What is the growth or decay rate?

45. What will the population of the city be in 10 years if it continues this growth rate?

46. How long will it take for it to double its size?

