

**Logs--Review of Basics****Expand each logarithm.**

1)  $\log_7 (x^2 \cdot y)^6$

2)  $\log_9 (3 \cdot 7 \cdot 8^5)$

3)  $\log_2 (c^5 \sqrt{a})$

4)  $\log_9 \frac{x^4}{y^2}$

**Solve each equation.**

5)  $\log_{14} (4x + 7) = \log_{14} (2 - x)$

6)  $\log_3 (4k - 4) = \log_3 (3k + 1)$

7)  $\log_{18} (5 - 2k) = \log_{18} -3k$

8)  $\log x + \log 9 = \log 63$

9)  $\log_8 (x - 4) - \log_8 x = 2$

10)  $\log_2 x + \log_2 (x + 14) = 5$

11)  $\log_5 x + \log_5 (x + 12) = \log_5 45$

12)  $\log_5 x - \log_5 (x + 1) = 1$

13)  $\left(\frac{1}{64}\right)^{3r-1} = 2^3$

14)  $4^{-3x} = 64^{-x}$

15)  $16^{-m} = \left(\frac{1}{4}\right)^{-2m-3}$

16)  $64^{-3n-2} = 16$

**Solve each equation. Round your answers to the nearest ten-thousandth.**

17)  $2^{4m} - 7 = 82$

18)  $6^{b+2} + 7 = 71$

**Condense each expression to a single logarithm.**

19)  $2 \log_5 w + 2 \log_5 u + 8 \log_5 v$

20)  $\log_6 2 + 5 \log_6 11 - 3 \log_6 5$

21)  $12 \log_9 x - 3 \log_9 y - 3 \log_9 z$

22)  $\log_5 10 + 5 \log_5 3 + 2 \log_5 11$

23. You have an initial investment of \$700 that you are putting into a savings account in which the interest is compounding continuously. After 10 years, your investment is now worth \$9000.

- a. Find the annual percentage rate to make this happen.
- b. How many years at that same rate would it take to triple your original investment?

24. You have an initial investment of \$500 that you are putting into a savings account in which the interest is compounding continuously. After 8 years, your investment is now worth \$1450.

- a. Find the annual percentage rate to make this happen.
- b. How many years at that same rate would it take to quadruple your original investment?