

## Exponents/Logs Review 77

Evaluate:

- 1)  $\log_3(27\sqrt{3}) =$       a)  $4/3$       b)  $7/2$       c)  $9/2$       d)  $2$
- 2)  $\log_3(1/\sqrt{27}) =$       a)  $3$       b)  $-2/3$       c)  $-3$       d)  $-3/2$
- 3)  $\log_5 25^{1/5} =$       a)  $2$       b)  $5/2$       c)  $2/5$       d)  $-2/5$
- 4)  $\log_{0.5} 32 =$       a)  $-10$       b)  $10$       c)  $5$       d)  $-5$
- 5) Solve for  $x$ , given that:       $\log_{64} x = -3/2$   
a)  $1/512$       b)  $-1/512$       c)  $16$       d)  $-16$
- 6) Write the logarithmic form:       $6^x = 32$   
a)  $x = \log_6 32$       b)  $32 = \log_6 x$       c)  $32 = \log_x 6$       d)  $6 = \log_x 32$
- 7) Write  $\log_3 x = a$  in exponential form.  
a)  $a^x = 3$       b)  $a^3 = x$       c)  $3^a = x$       d)  $3^x = a$
- 8) Write  $10^{-2} = 0.01$  in logarithmic form.  
a)  $-2 \log_{10} 10 = 0.01$       b)  $\log(-2) = 0.01$   
c)  $\log_{10} 10 = -2$       d)  $\log(0.01) = -2$
- 9) Which of the following represents  $M = \log_a R$  in exponential form?  
a)  $R^a = M$       b)  $M^a = R$       c)  $a^M = R$       d)  $a^R = M$
- 10) What is the logarithmic form of  $5^x = 6$ ?  
a)  $\log_5 x = 6$       b)  $\log_6 x = 5$       c)  $\log_5 6 = x$       d)  $\log_x 6 = 5$
- 11) Write as a single logarithm:       $3 \log_8 5 - \log_8 6 =$   
a)  $\log_8(750)$       b)  $\log_8(125/6)$       c)  $\log_8(5/2)$       d)  $\log_8 119$

12) Evaluate  $\log_2 56 - \log_4 49 =$

- a) 6                      b)  $\log 8$                       c) 2                      d) 3

13) Give the equation which is equivalent to:  $x \log 3 + 7 \log 3 = 2 \log 5$

- a)  $x + 7 = \log(25/3)$                       b)  $3^{x+7} = 5^2$   
c)  $3x + 21 = 10$                       d)  $(x + 7)^3 = 25$

14) The sum of  $\log_2 4 + \log_2 32$  is:

- a)  $\log 8$                       b)  $\log_{128} 2$                       c)  $\log 128$                       d)  $\log_2 128$

15) If  $\log_x A = 3$  and  $\log_x B = 2$ , evaluate:

- a)  $\log_x(A/B^2)$                       b)  $(\log_x AB)^2$

16) If  $\log m = y$ , which expression is equivalent to  $\log(100 m^2)$ ?

- a)  $4y$                       b)  $2y^2$                       c)  $2 + y^2$                       d)  $2 + 2y$

17) If  $a = \log_4 Q$  and  $b = 2 \log_4 P$ , determine an expression for  $Q/P$ .

- a)  $2^{2a - b}$                       b)  $2a/b$                       c)  $a/2b$                       d)  $2^{a-2b}$

18) Given that  $\log_2 3 = x$ ,  $\log_2 5 = y$ , and  $\log_2 7 = z$ , then  $\log_2 \sqrt{21} =$

- a)  $(x + z)/2$                       b)  $\log_2 \sqrt{xz}$                       c)  $\log_2(x + z)^{1/2}$                       d)  $(1/2)\log_2(xz)$

19) Solve for  $x$  given that:  $\log 64 = 2 \log x$

- a)  $\pm 4$                       b) 8                      c) 4                      d)  $\pm 8$

20) Solve for  $x$ , given that:  $\log_b(2x + 1) - \log_b(x - 1) = \log_b 3$

- a)  $4/5$                       b) 5                      c) 2                      d) 4

21) Solve  $\log_2(x - 3) + \log_2(x + 1) = 5$

- a) -7, 5                      b) 7                      c) 5                      d) 7, -5

22) Solve :  $\log(10 - 3x) - 2 \log(x) = 0$

- a)  $x = 5$                       b)  $x = 2$                       c)  $x = -5, 2$                       d)  $x = 5, -2$

23) Solve for  $x$  :  $\log x = 3 \log a - \log b + \log c$

- a)  $a^3c/b$                       b)  $3ac/b$                       c)  $3a/bc$                       d)  $a^3/bc$

24) The bacteria population in a petri dish doubles every 4 days. Determine an expression for the number of bacteria  $N$ , after  $t$  days, given that the initial number of bacteria is 50.

- a)  $N = 50(4)^{-t/2}$     b)  $N = 50(4)^{t/2}$     c)  $N = 50(2)^{t/4}$     d)  $N = 50(2)^{-t/4}$

25) Which of the following equations describes the set of all points  $(3^t, t)$ ?

- a)  $y = 3x$                       b)  $y = 3^x$                       c)  $y = \log_3 x$                       d)  $x = \log_3 y$

26) Which one of the following equations gives the amount  $P$  that should be invested at 8% per annum, compounded annually, so that \$2000 will be available after 7 years?

- a)  $P = 2000(0.08)^7$                       b)  $P = 2000(1.08)^7$   
c)  $P = 2000/(0.08)^7$                       d)  $P = 2000/(1.08)^7$

27) The population of a colony of bacteria doubles every 24 hours. How long does it take for the population to become 2.5 times its original size? (Give the answer to two significant digits)

28) A bacteria population is halved every 4 days. Determine an expression for the number of bacteria  $N$ , after  $t$  days, given that the initial number of bacteria is 50.

- a)  $N = 50(4)^{-t/2}$     b)  $N = 50(4)^{t/2}$     c)  $N = 50(2)^{t/4}$     d)  $N = 50(2)^{-t/4}$

Answers : 1) b, 2) d, 3) c, 4) d, 5) a, 6) a, 7) c, 8) d, 9) c, 10) c, 11) b, 12) d, 13) b, 14) d, 15) a) -1, b) 25, 16) d, 17) a, 18) a, 19) b, 20) d, 21) b, 22) b, 23) a, 24) c, 25) c, 26) d, 27) 32, 28) d.