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1) Simplify: $(3x)(4x)^2$

2) Simplify: $(3a^2)^3$

3) Simplify: $(-3np)(4n^2p^2)$

4) Simplify: $\dfrac{27a^3b^2c}{-3abc}$

5) Simplify: $\dfrac{16xy^2}{24x^2y}$

6) Simplify: $\left(\dfrac{x^2}{2y^3}\right)^2$

7) Simplify: $\sqrt[3]{-8x^6y^3}$

8) Simplify and express with positive exponents: $4x^{-2}$

9) Simplify and express with positive exponents: $-8y^{-3}$

10) Simplify and express with positive exponents: $\dfrac{3}{4x^{-3}}$

11) Simplify and express with positive exponents: $\dfrac{3}{(2x)^{-3}}$

12) Simplify and express with positive exponents: $\left(\dfrac{x^2}{3}\right)^{-3}$

13) Simplify and express with positive exponents: $\dfrac{6a^{-3}b^2}{3ab^{-2}}$

14) Simplify and express with positive exponents: $(-3x)^{-2}$

15) Simplify and express with positive exponents: $(c^{-2})^3$

16) Simplify and express with positive exponents: $(2x^{-3})^{-2}$

17) Simplify and express with positive exponents: $\left(\dfrac{2x^{-4}}{y^{-3}}\right)^2$

18) Simplify and express with positive exponents: $\left(\dfrac{-2ab}{3a^{-2}b^2}\right)^3$

19) The value of $(-64)^{\frac{2}{3}}$ is

  A) -16   C) 512

  B) $-\dfrac{1}{16}$ D) 16

20) Find the value of $\left(\dfrac{8}{27}\right)^{-\frac{2}{3}}$.

  A) $-\dfrac{4}{9}$ C) $\dfrac{4}{9}$

  B) $\dfrac{9}{4}$ D) $-\dfrac{2}{3}$

21) What is the value of $2x^{-\frac{1}{3}}$ if $x = 8$?

  A) 1   C) $\dfrac{1}{4}$

  B) 2   D) $\dfrac{1}{2}$

22) Evaluate: $16^{\frac{3}{4}}$

  A) 32   C) $\dfrac{1}{8}$

  B) 8   D) $\dfrac{1}{32}$

23) Evaluate: $\left(\dfrac{9}{49}\right)^{-\frac{3}{2}}$

  A) $\dfrac{27}{343}$ C) $\dfrac{343}{27}$

  B) $-\dfrac{27}{343}$ D) $-\dfrac{343}{27}$

24) (no work) Which equation is equivalent to $y = 10^x$?

  A) $y = 10^{-x}$

  B) $y = \left(\dfrac{1}{10}\right)^{-x}$

  C) $y = -10^{-x}$

  D) $y = \left(\dfrac{1}{10}\right)^{x}$

25) Solve: $(x + 1)^{\frac{3}{2}} = 64$

  A) 511   C) 17

  B) 21   D) 15

26) If $\log_9 x = \dfrac{3}{2}$, what is the value of x?

  A) 27   C) 8

  B) $\dfrac{27}{2}$ D) $\dfrac{3}{2}$

27) If $\log_x 2 = \dfrac{1}{3}$, what is the value of x?

  A) $\sqrt[3]{2}$ C) 8

  B) 4   D) $2\dfrac{1}{3}$

28) (no work) What is $\log_3 x = a$ written in exponential form?

  A) $3^a = x$ C) $a^3 = x$

  B) $a^x = 3$ D) $3^x = a$

29) (no work) Which equation is equivalent to $y = 3^x$?

  A) $\log_y x = 3$

  B) $\log_y 3 = x$

  C) $\log_3 y = x$

  D) $\log_3 x = y$

Check #'s 19-29

AAABBBCCCDD

30) Find the value of $\log_3 \frac{1}{3}$.

31) Find the value of $\log_{\frac{1}{4}} \frac{1}{16}$.

32) Find the value of $\log_8 4$.

33) Find the value of $\log_{27} \frac{1}{9}$.

34) Solve: $\log_x \frac{1}{16} = -2$

35) Solve: $\log_x 27 = \frac{3}{4}$

36) Solve: $\log_4 x = -3$

37) Solve: $\log_6 x = -1$

38) Solve: $\log_4 x = -\frac{1}{2}$

39) Solve: $\log_{27} x = -\frac{2}{3}$

40) Solve: $\log_{\frac{2}{3}} x = -3$

41) Solve: $\log_4 (3x + 1) = 2$

42) If $\log_{(x+1)} 27 = 3$, find the value of x.

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43) If $\log_x \frac{1}{4} = -1$, find x. *no work*

44) The expression $\log 4x$ is equivalent to

A) $4 \log x$
B) $\log x^4$
C) $(\log 4)(\log x)$
D) $\log 4 + \log x$

45) The expression $\log 12$ is equivalent to

A) $\log 6 + \log 6$
B) $\log 3 \cdot \log 4$
C) $\log 3 - 2 \log 2$
D) $\log 3 + 2 \log 2$

46) $\log \frac{\sqrt{a}}{\sqrt{b}}$ is equivalent to

A) $\frac{1}{2} \log a + \log b$
B) $\frac{1}{2}(\log a - \log b)$
C) $\frac{1}{2} \log a - \log b$
D) $\frac{1}{2}(\log a + \log b)$

47) The expression $\log \frac{\sqrt[4]{a^2}}{\sqrt[4]{b}}$ is equivalent to

A) $\frac{1}{2}(4 \log a - \log b)$
B) $4(\log a^2 - \log b)$
C) $\frac{1}{4}(2 \log a - \log b)$
D) $\frac{1}{4}(\frac{\log a}{\log b})$

48) The expression $\log a + \frac{1}{2} \log b$ is equivalent to

A) $\log \sqrt{ab}$
B) $\log a\sqrt{b}$
C) $\log (a + \sqrt{b})$
D) $(\log a)(\frac{1}{2} \log b)$

Reminder: Show all steps!

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49) The expression $\frac{1}{3} \log (a) - 3 \log (b)$ is equivalent to

A) $\log \frac{a}{3b^3}$
B) $\log (\sqrt[3]{a} - b^3)$
C) $\log \frac{\sqrt[3]{a}}{3b}$
D) $\log \frac{\sqrt[3]{a}}{b^3}$

50) Which of the following equations is equivalent to $x \log 3 + 7 \log 3 = 2 \log 5$?

A) $3^{x+7} = 5^2$
B) $3^{7x} = 32$
C) $3x + 21 = 10$
D) $(x + 7)^3 = 25$

51) Solve for x: $\log 81 = 4 \log x$

A) 1   C) 3
B) 9   D) 4

52) Solve for x: $\log(x - 3) = (\log x - \log 2)$

A) $(2,1)$
B) $\frac{3 + \sqrt{11}}{2}$
C) 6
D) $\frac{5}{2}$

53) Solve for x: $\log_2 (x - 3) + \log_2 (x + 1) = 5$

A) 5, only
B) 7, only
C) $\{-7,5\}$
D) $\{-5,7\}$

54) Solve for x: $\log(x - 3) + \log(x + 4) - \log x = \log 5$

A) $\{2,6\}$
B) $\{-6,2\}$
C) $\{-2,6\}$
D) 6, only

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

A) $\{-2,5\}$
B) 2, only
C) 5, only
D) $\{-5,2\}$

Check #44-55:   A B B B B
                C C C D D D