

Solving Exponential & Logarithmic Equations

Date _____ Period _____

Solve each equation. Give the exact answer and the decimal, rounded to the nearest ten-thousandth.

1) $20^{3m} = 72$

2) $18^{x-3} = 33$

3) $4^{-7n} = 84$

4) $14^{x-4.8} = 36.9$

5) $13^{-4r} = 84$

6) $18^{n-9} = 63$

Solve each equation.

7) $\log_{19} (5p - 7) = \log_{19} 3$

8) $\log_{13} (2x + 3) = \log_{13} (5x - 6)$

9) $\log_3 (n + 6) = \log_3 3n$

10) $\log_{13} (6 - 4n) = \log_{13} (-5n - 8)$

11) $\log_{14} (4n^2 - n) = \log_{14} (56 + 3n^2)$

12) $\log_2 (x^2 + 3x) = \log_2 (72 + 2x)$

13) $\log_{15} (36 + 2x) = \log_{15} (x^2 - 3x)$

14) $\log_4 (4b^2 - 16b) = \log_4 (-60 + 3b^2)$

15) $-7\log_{12} (-7v - 8) = 0$

16) $-10\log (7 - 7m) = -10$

17) $\log_7 (x - 5) + \log_7 9 = 2$

18) $\log_8 4x^2 + \log_8 4 = 2$

19) $\log 2x + \log 5 = 1$

20) $\log_4 x - \log_4 (x - 2) = 2$

21) $\log_5 (x - 5) + \log_5 9 = \log_5 78$

22) $\log_5 7 - \log_5 -5x = 2$

23) $4^{-3v-1} = 4^{1-v}$

24) $64^{2r} = 8^{r-2}$

25) $64^{3v} = 32^{-2v+3}$

26) $3^{p-3} = 3^{-2p}$

Answers to Solving Exponential & Logarithmic Equations (ID: 1)

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|------------------------------------|-------------------------------------|-----------------------------------|------------------------------------|
| 1) 0.4759 | 2) 4.2097 | 3) -0.4566 | 4) 6.1672 |
| 5) -0.4319 | 6) 10.4334 | 7) {2} | 8) {3} |
| 9) {3} | 10) {-14} | 11) {-7, 8} | 12) {8, -9} |
| 13) {9, -4} | 14) {10, 6} | 15) $\left\{-\frac{9}{7}\right\}$ | 16) $\left\{-\frac{3}{7}\right\}$ |
| 17) $\left\{\frac{94}{9}\right\}$ | 18) {2, -2} | 19) {1} | 20) $\left\{\frac{32}{15}\right\}$ |
| 21) $\left\{\frac{41}{3}\right\}$ | 22) $\left\{-\frac{7}{125}\right\}$ | 23) {-1} | 24) $\left\{-\frac{2}{3}\right\}$ |
| 25) $\left\{\frac{15}{28}\right\}$ | 26) {1} | | |