

# PC 12 LG 4 Worksheet (Logarithmic Equations)

Solve for  $x$  exactly.

1.  $\log x = 2$

9.  $\log_3 x + \log_3 x = \log_3 16$

2.  $\log(x + 1) = -1$

10.  $\log 4 = x \log 2$

3.  $\log(\log x) = 1$

11.  $\log_9 16 = 4 \log_9 x$

4.  $\log 1000 = x$

12.  $\log_2 x + \log_2 3 = 4$

5.  $2 \log_3 x = 4$

13.  $\log_3 x - \log_3 2 = 2$

6.  $\log 2x = \log 2 + \log 4$

14.  $\log_2(\log_3 x) = 2$

7.  $\log 6 - \log 5 = \log x$

15.  $\log_2 x + \log_2(x - 2) = \log_2 8$

8.  $\log x - \log 7 = \log 3$

16.  $\log_2 x + \log_2(x - 2) = 3$

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17.  $\log(x+2) + \log(x-1) = 1$

18.  $\log(3x+2) + \log(x-1) = 2$

19.  $\log_2 x - \log_2(x-3) = 4$

20.  $\log_3(x-2) - \log_3(x+1) = \log_3 5$

21.  $\log(3x^2 + 2x - 4) = 0$

22.  $\log_5(x-3) + \log_5(x+4) - \log_5 x = \log_5 5$

## Answer Key

- |     |                 |     |                                       |
|-----|-----------------|-----|---------------------------------------|
| 1.  | 100             | 16. | 4, reject -2                          |
| 2.  | $\frac{-9}{10}$ | 17. | 3, reject -4                          |
| 3.  | $10^{10}$       | 18. | 6, reject -5.667                      |
| 4.  | 3               | 19. | $\frac{16}{5}$                        |
| 5.  | 9               | 20. | No Solution,<br>reject $\frac{-7}{4}$ |
| 6.  | 4               | 21. | 1, $\frac{-5}{3}$                     |
| 7.  | $\frac{6}{5}$   | 22. | 6, reject -2                          |
| 8.  | 21              |     |                                       |
| 9.  | 4               |     |                                       |
| 10. | 2               |     |                                       |
| 11. | 2               |     |                                       |
| 12. | $\frac{16}{3}$  |     |                                       |
| 13. | 18              |     |                                       |
| 14. | 81              |     |                                       |
| 15. | 4, reject -2    |     |                                       |