

No Calculators!!

Write as a single logarithm.

1. $\log_2 k - \frac{1}{2} \log_2 3$

2. $\log a + 3 \log t - \log w$

3. $3 \log_2 x - 4 \log_2 x^2$

Expand.

4. $\log_2 \left(\frac{r\sqrt{s}}{t^3} \right)$

5. $\log_7 (v\sqrt[5]{w})$

6. $\log_5 (c\sqrt[3]{b})$

Simplify.

7. $\log_3 81^2$

8. $\log_2 \left(\frac{1}{2} \right)^4$

9. $\log_5 \left(\frac{1}{25} \right)^3$

10. $\log 20 + \log 5$

11. $\log_2 16 - \log_2 2$

12. $\log_2 32 - \log_2 128$

13. $\log_3 3 + \log_3 27$

14. $\log_2 160 - \log_2 5$

15. $\log_8 4 + \log_8 16$

Solve for x .

16. $\log_3 (x+4) = 2$

17. $\log_2 \left(1 + \frac{x}{2} \right) = 4$

18. $\log x - \log 6 = \log 15$

19. $\log x + \log 2 = \log 8$

20. $\log x + \log (x+9) = 1$

21. $\log 45x - \log 3 = 1$

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

23. $\log 8 + 3 \log x = 3$

24. $2 \log x - \log 4 = 0$

Rewrite in log base 10.

25. $\log_a 3$

26. $\log_5 27$

27. $\log_7 22$

28. $\log_8 46$

29. $\log_9 x$

Solve for x . Leave your answer in terms of log base 10.

30. $7^x = 3$

31. $12^x = 47$

32. $5^{x-2} = 24$

33. $9^{2x} = 14$

34. $13^{4x-9} = 92$

35. $4^x - 7 = 3$

36. $5(8)^x = 45$

37. $\frac{2}{3}(12)^x = 10$

38. $2(7)^{3-x} = 32$