

Name _____ Class _____ Date _____

Natural Logarithms

Write each expression as a single natural logarithm.

1. $(1/2)\ln 9 + \ln 3x$

2. $4 \ln x + 3 \ln y$

3. $(1/3)\ln 8 + \ln x$

4. $3 \ln a - b \ln 2$

Solve each equation. Check your answers. Round your answer to the nearest hundredth.

5. $2 \ln (3x - 4) = 7$

6. $5 \ln (4x - 6) = -6$

7. $-7 + \ln 2x = 4$

8. $3 - 4 \ln (8x + 1) = 12$

9. $\ln x + \ln 3x = 14$

10. $\ln x - \ln 5 = -1$

11. $\ln e^x = 3$

12. $3 \ln e^{2x} = 12$

13. $\ln e^{x+5} = 17$

14. $5 \ln (3x - 2) = 15$

15. $7 \ln (2x + 5) = 8$

16. $\ln (2x/41) = 2$

Use natural logarithms to solve each equation. Round your answer to the nearest hundredth.

17. $e^x = 15$

18. $4e^x = 10$

19. $e^{x-4} = 2$

20. $5e^{6x+3} = 0.1$

21. $e^x = 1$

22. $e^{\frac{x}{5}} = 32$

23. $3e^{3x-5} = 49$

24. $7e^{5x+8} = 0.23$

25. $6 - e^{12x} = 5.2$

26. $e^{\ln 5x} = 20$

27. $e^{\ln x} = 21$

28. $e^{x+6} + 5 = 1$

Simplify each expression using the properties of natural logarithms.

29. $2\ln e^4$

30. $5 \ln e^5$

31. $\frac{\ln e^2}{2}$

32. $\ln e^{100}$