

HOMWORK: LOG PROPERTIES

NAME: _____ DAY 4 DUE: _____

1. $\log_a 1 =$	6. $\log_a (MN) =$
2. $\log_a a =$	7. $\log_a \left(\frac{M}{N} \right) =$
3. $\ln 1 =$	8. $\log_a M^r =$
4. $a^{\log_a m} =$	9. $\ln e =$
5. $\log_a a^r =$	10. $\log_a M =$

Find the exact value of each expression.

1. $\log_2 2^{-13}$

2. $e^{\ln 8}$

3. $\log_8 16 - \log_8 2$

4. $\ln e^{\sqrt{2}}$

5. $\log_6 9 + \log_6 4$

Use the change of base formula to evaluate the logarithm.

6. $\log_4 7$

7. $\log_5 13$

8. $\log_3 15$

9. $\log_8 22$

Expand each expression.

10. $\log_3 \frac{x}{9}$

11. $\log_7 x^5$

12. $\ln \frac{e}{x}$

13. $\log_3 5v^3x^2$

14. $\log_2 \left(\frac{y^5}{y+3} \right)$

15. $\log_5 \left(\frac{\sqrt[3]{x^2+1}}{x^2-1} \right)$

Condense each expression.

16. $2\log_3 u - \log_3 v$

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

18. $\log_a x + \log_a 9 - \log_a 5$

19. $\frac{1}{3}\log(x^3+1) + \frac{1}{2}\log(x^2+1)$

20. $21\log_3 \sqrt[3]{x} + \log_3(9x^2) - \log_3 9$