

Evaluate the following logarithms:

1. $\log_3 3 =$	2. $\log_3 1 =$
3. $\log_5 5 =$	4. $\log_5 1 =$
5. $\log 10 =$	6. $\log 1 =$
$\log_b b =$	$\log_b 1 =$

Properties of Logarithms

Condensed Form:	Expanded Form:
$\log_b m \cdot n$	
$\log_b \frac{m}{n}$	
$\log_b m^p$	

Expand the following expressions:

7. $\log_3(6 \cdot 2)$	8. $\log_7 3xy$	9. $\log_3 3x^4$
10. $\log_6 \frac{5}{y}$	11. $\log \sqrt[5]{2x}$	12. $\log_2 \sqrt{x}$

Developing Intuition for Logarithms

Honors Algebra 2
7.5 Properties of Logarithms

Condense the following expressions:

13. $\log 9 + 3 \log 2 - \log 3$	14. $\log 4 + 3 \log 3 - \log 12$	15. $\frac{1}{2} \log_3 64 + \log_3 x$
16. $2 \log 8 - \log 4 - \log 16$	17. $4 \log x - 6 \log 2$	18. $2(\log_3 12 - \log_3 3) + \frac{1}{3} \log_3 8$

For the following examples use $\log_3 2 \approx 0.631$ and $\log_3 7 \approx 1.7712$ to evaluate the logarithm using the properties of logarithms. Do not use a calculator!

19. $\log_3 4$	20. $\log_3 \frac{7}{2}$	21. $\log_3 108$
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Solve the following using the Properties of Logarithms:

$$22. \log_3 2 - \log_3 6 = \log_3 x$$

$$23. 2\log_3 y + \log_3 0.1 = \log_3 5 + \log_3 2$$

$$24. \log_2(x - 3) = \log_2 10 - \log_2 \frac{5}{2} + \log_2 \frac{1}{2}$$

$$25. \log_2 x + \log_2(x - 4) = 5$$