

Properties of Logarithms Guided Notes

1. Properties of Logarithms

1. $\log_b 1 =$ _____	
2. $\log_b b =$ _____	
3. $\log_b b^k =$ _____	Inverse property
4. $b^{\log_b a} =$ _____	Inverse property
5. $\log_b xy =$ _____	Product property
6. $\log_b \frac{x}{y} =$ _____	Quotient property
7. $\log_b a^n =$ _____	Power property

2.

Logarithmic Property	Exponential equivalent	Example
1. $\log_b 1 = 0$		$\log_{24} 1 =$
2. $\log_b b = 1$		$\log_{42} 42 =$
3. $\log_b b^k = k$		$\log_7 7^2 =$
4. $b^{\log_b a} = a$		$5^{\log_5 8} =$
5. $\log_b xy = \log_b x + \log_b y$		$\log_6 9 + \log_6 4 =$
6. $\log_b \frac{x}{y} = \log_b x - \log_b y$		$\log_{\frac{1}{5}} 100 - \log_{\frac{1}{5}} 4 =$
7. $\log_b a^n = n \log_b a$		$\log_5 25^8 =$

3. Sample Problem 1

Use the properties of logarithms to evaluate expressions:

a) $\log_{\frac{1}{5}} \frac{1}{5}$ b) $\log_{0.5} 0.5^3$ c) $8^{\log_8 64}$

a) _____ b) _____ c) _____

4. Sample Problem 2

Write logarithmic expression as a single logarithm: $\log_3 324 - 2 \log_3 2$

Solution
