

7-4 Day 2 Properties of Logarithms

Remember that when you *divide* powers with the same base, you subtract the exponents.

$$\frac{a^m}{a^n} = a^{m-n}$$

Quotient Property of Logarithms

For any positive numbers m , n , and b ($b \neq 1$)

WORDS	NUMBERS	ALGEBRA
<i>The logarithm of a quotient is the logarithm of the dividend minus the logarithm of the divisor.</i>	$\log_5 \left(\frac{16}{2} \right)$ $= \log_5 16 - \log_5 2$	$\log_b \frac{m}{n}$ $\log_b m - \log_b n$

1. Adding and Subtracting Logarithms

Express as a single logarithm. Simplify, if possible.

a) $\log_2 32 - \log_2 4$

$$\log_2 \left(\frac{32}{4} \right) = \log_2 8 = 3$$

b) $\log_7 49 - \log_7 7$

$$\log_7 \left(\frac{49}{7} \right) = \log_7 7 = 1$$

7-4 Day 2

Properties of Logarithms



- Students will be able to use the quotient property of logarithms to simplify logarithms with 80% accuracy.

$$\frac{b^m}{b^n} = b^{m-n}$$

Quotient Property of Logarithms

For any positive numbers m , n , and b ($b \neq 1$)

WORDS	NUMBERS	ALGEBRA
The logarithm of a quotient is the logarithm of the dividend minus the logarithm of the divisor.	$\log_5 \left(\frac{16}{2} \right) =$ $\log_5 16 - \log_5 2$	$\log_b m - \log_b n$ $\log_b \left(\frac{m}{n} \right) =$

1. Adding and Subtracting Logarithms

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Name: _____ Date: _____ Period: _____

Worksheet 7-4 Day 2

Use the Quotient Property to express as a single logarithm. Then simplify.

1. $\log_2 80 - \log_2 10$

2. $\log_{10} 4000 - \log_{10} 40$

3. $\log_4 384 - \log_4 6$

4. $\log_2 1920 - \log_2 30$

5. $\log_3 486 - \log_3 2$

6. $\log_6 180 - \log_6 5$

7. $\log_3 81 - \log_3 27$

8. $\log_2 256 - \log_2 64$

9. $\log_7 13.3 - \log_7 1.9$

10. $\log_4 128 - \log_4 8$