



6-5 Reteach to Build Understanding

Properties of Logarithms

1. Complete the table below by filling in the blanks to complete the table.

Exponential and Logarithmic Definitions and Properties

	Algebra	Numbers
Definition of Logarithm	$y = \log x$ only if $b^y = x$	$y = \log_3 4$ only if
Product Property	$\log_b(mn) = \log_b m + \log_b n$	___ = $\log_4(2) + \log_4(8)$
Quotient Property	$\log_b \frac{m}{n} = \log_b m - \log_b n$	$\log_8 \frac{6}{7} = \log_8 \frac{6}{7} - \log_8 \frac{7}{7}$
Power Property	$\log_b(m^n) = n \cdot \log_b m$	$\log_2(25) = \log_2(5^2) = 2 \cdot \log_2 5$
Change of Base Property	$\log_b m = \frac{\log_a m}{\log_a b}$	$\log_3 5 = \frac{\log 5}{\log 3}$

2. Using the properties of logarithms, complete the following expressions. Then match the expressions with the property you used. Where necessary, match the logarithmic function with its description.
- a. $\log_2(a^3 b^4) = \log_2(a^3) + \log_2(b^4)$ Quotient Property
- b. $\log_2(\frac{1}{a}) + \log_2(\frac{1}{b}) = 3 \log_2 a + 4 \log_2 b$ Change of Base
- c. $y = \log_5 7$ Power Property
- d. $\frac{\log 4}{\log 2} = \log_2 4$ Logarithmic Function
- e. $\log_7 \frac{3}{4} = \log_7 3 - \log_7 4$ Product Property
3. Describe and correct the error a student made in writing $\log_7 2 + 2 \log_7 x$ in terms of a single logarithm.

$$\log_7 2 + 2 \log_7 x$$

Given expression

$$= \log_7 2 + \log_7 2x$$

$$= \log_7(2x + 2)$$