Log Properties (Identify, Simplify)

UNIT 8 LESSON ____ INVESTIGATION ____ NOTES

Lesson Vocabulary

Properties of Logs - 3 properties

1. $\log_b MN = \log_b M + \log_b N$ - Product Prop.
2. $\log_b \frac{M}{N} = \log_b M - \log_b N$ - Quotient Prop.
3. $\log_b M^x = x \log_b M$ - Power Prop.

Simplify Logs - Write each log expression as a single log using the properties. Follow order of operations rules.

Example Problem(s)

ex.) Identify the property.

a) $\log_5 2 + \log_5 6 = \log_5 12$ - Product Prop.

b) $\log_2 8 - \log_2 4 = \log_2 2$ - Quotient

c) $3\log_2 5 = \log_2 125$ - Power

d) $\log_4 27 - \log_4 3 + \log_4 2 = \log_4 18$ - Quotient, Product

e) $4\log_2 3 + \log_2 5 = \log_2 405$ - Power, Product

ex.) Simplify as a single log.

a) $\log_3 20 - \log_3 4$

$\log_3 \frac{20}{4}$

$\log_3 5$

b) $3\log 2 + \log 4 - \log 16$

$\log 2^3 + \log 4 - \log 16$

$\log 8 + \log 4 - \log 16$

$\log 32 - \log 16$

$\log 2$

c) $\log 2 + \log 11 + \log 7$

$\log 22 + \log 7$

$\log 154$

d) $2\log_3 12 - \log_3 6$

$\log_3 12^2 - \log_3 6$

$\log_3 144 - \log_3 6$

$\log_3 \frac{144}{6}$

$\log_3 24$