

Section 5.6

Properties of Logarithms

Important Log Properties

$$1) \log_a(uv) = \log_a u + \log_a v \quad \text{Product Property}$$

$$2) \log_a \frac{u}{v} = \log_a u - \log_a v \quad \text{Quotient Property}$$

$$3) \log_a u^n = n \log_a u \quad \text{Power property}$$

Class Examples Together:

$$1) \log_{10} \frac{2}{3}$$

$$2) \log_{10} 6$$

$$3) \log_{10} 9$$

I can Re-write the logarithm of a product

Re-Write $\log_{10} 7x^3$

I can use log properties to condense a expression

Condense $\log_{10} x - \log_{10} 3$

Condense $\log_{10} 2 - 2\log_{10} x$

I can expand a logarithmic Expression

Expand $\log_2 3xy^2$

Classwork: Use the log rules to expand the following expressions

$$1) \log_2 3x$$

$$2) \log_8 16x$$

$$3) \log_{10} 2x^3$$

$$4) \log_4 \frac{6}{5}$$

$$5) \log_5 9$$

$$6) \log_6 \frac{10}{3}$$

$$7) \log_3 x^3$$

$$8) \log_3 6xy$$

$$9) \log_{10} 7x^3yz$$

Use the log rules to condense the expression:

$$1) \log_5 6 - \log_5 4$$

$$2) \log_3 13 + \log_3 3$$

$$3) 2\log_{10} x + \log_{10} 5$$

$$4) 5\log_4 12 - 5\log_4 2$$

$$5) 3\log_3 19 - 3\log_3 38$$

$$6) \log_7 48 - 4\log_7 2$$

$$7) \log_{10} 8 + \log_{10} x + 2\log_{10} y$$

$$8) \log_{10} 6 - 3\log_{10} \frac{1}{3}$$