

5.3

Condensed Expanded

<p>Properties of Logarithms If $m > 0, n > 0,$ $b > 0,$ and $b \neq 1,$ and a is any real number</p>	<ul style="list-style-type: none"> ▪ Product Property ▪ Quotient Property ▪ Power Property 	$\log_b m \cdot n = \log_b m + \log_b n$ $\log_b m \div n = \log_b m - \log_b n$ $\log_b m^a = a \log_b m$
<p>Properties of Natural logarithms</p>	<ul style="list-style-type: none"> ▪ ▪ ▪ 	
<p>Exponential Equation</p>		
<p>Change of base formula</p>		
<p>Logarithmic equation</p>		
<p>Principal</p>		
<p>Simple interest</p>		
<p>Interest</p>		
<p>Simple Interest Formula</p>		
<p>Compound Interest Formula</p>		
<p>Continuous Compound Interest</p>		

5.3 Properties of Logarithms

Ex1 Use the properties of logarithms to write each expression in simplified (condensed) form.

a) $\log_4 3 + \log_4 x$

$$\log_4 3x$$

b) $\log x - \log 5$

$$\log \frac{x}{5}$$

c) $7\log_2 x + 4\log_2 y$

$$\log_2 x^7 + \log_2 y^4$$
$$\log_2 x^7 \cdot y^4$$

Try it...

a) $\log 2 - \log 6$

$$\log \frac{1}{3}$$

b) $6\log_8 x + 2\log_8 y$

$$\log_8 x^6 \cdot y^2$$

c) $3\log_5 a - 4\log_5 b$

$$\log_5 \frac{a^3}{b^4}$$

Ex2: Use the properties of logarithms to write each expression in expanded form

a) $2\log_3 4x^2$

$$2\log_3 4 + 2\log_3 x^2$$

$$2\log_3 4 + 4\log_3 x$$

b) $\log_5 \frac{x^m}{4^n}$

$$\log_5 x - \log_5 4$$

c) $\log_6 \frac{5}{x^2}$

$$\log_6 5 - 2\log_6 x$$

d) $\log \frac{x^3}{y^4}$

$$3\log x - 4\log y$$