

**Log Properties (RED)****Product Property**

1. Simplify the expressions.

a.  $\log_3 4 + \log_3 3$   $\log_3(4 \cdot 3) \rightarrow \log_3 12$

b.  $\log_5 2y + \log_5 22y$   $\log_5(2y \cdot 22y) \rightarrow \log_5 44y^2$

c.  $\log_6 2x + \log_6 x + \log_6 5x$   $\log_6(2x \cdot x \cdot 5x) \rightarrow \log_6 10x^3$

2. Expand the expressions

a.  $\log_3 4x$   $\log_3 4 + \log_3 x$

b.  $\log_5 2 \cdot 3$   $\log_5 2 + \log_5 3$

c.  $\log_7((x+7)(x-2))$   $\log_7(x+7) + \log_7(x-2)$

Check in w/ Ms. Lambert for a Quick Check.  
(to check you understanding of the property)

**Quotient Property**

3. Simplify the expressions.

a.  $\log_6 8 - \log_6 4$   $\log_6 \frac{8}{4} \rightarrow \log_6 2$

b.  $\log_3 16x - \log_3 2x$   $\log_3 \frac{16x}{2x} \rightarrow \log_3 8$

c.  $\log(x+5) - \log(x-2)$   $\log \frac{x+5}{x-2}$

4. Expand the expressions

a.  $\log_9 \frac{x}{y}$   $\log_9 x - \log_9 y$

b.  $\log_3 \frac{1}{2}$   $\log_3 1 - \log_3 2$

c.  $\log_6 \frac{x-3}{x+4}$   $\log_6(x-3) - \log_6(x+4)$

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(to check you understanding of the property)

**Power Property**

5. Simplify the expressions.

a.  $4\log_2 x$   $\log_2 x^4$

b.  $5\log_6 7$   $\log_6 7^5$

c.  $2\log(x-8)$   $\log(x-8)^2$

6. Expand the expressions

a.  $\log_3 x^2$   $2\log_3 x$

b.  $\log_4(6x)^3$   $3\log_4(6x)$

c.  $\log_8(x-9)^4$   $4\log_8(x-9)$

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(to check you understanding of the property)

**Change of Base**

7.  $\log_4 64$   $\frac{\log 64}{\log 4}$  3

8.  $\log_6 216$   $\frac{\log 216}{\log 6}$  3

9.  $\log_4 16$   $\frac{\log 16}{\log 4}$  2

10.  $\log_3 \frac{1}{243}$   $\frac{\log \frac{1}{243}}{\log 3}$  -5

11.  $\log_{343} 7$   $\frac{\log 7}{\log 343}$   $\frac{1}{3}$

12.  $\log_2 16$   $\frac{\log 16}{\log 2}$  4

Check in w/ Ms. Lambert for a Quick Check.  
(to check you understanding of the property)