Name: _____

Log Review Problems

Combine into one logarithm:

1) $\log 60 - \log 4$

2) $\log(a+b) - \log(a-b)$

3) $\log p + 2\log r - \log 2$

4) $\log 1 + \log 2 + \cdots + \log(n-1) + \log n$

Expand the logarithm completely:

1) $\log ab^3$

2) $\log 9b^{\frac{4}{5}}(1+a)^3$

1) $\log \dfrac{a^3}{\sqrt[3]{b^2c}}$

2) $\log \sqrt[4]{\dfrac{a^3\sqrt{c}}{b}}$

Properties of logs: If you know that $\log_b 2 = m$, $\log_2 3 = n$, $\log_b 5 = r$, and $\log_b 7 = s$ then write the following logs in terms of m, n, r and s.

9) $\log_b \frac{2}{3}$

10) $\dfrac{\log_b 2}{\log_b 3}$

9) $\log_b 2^2$

10) $(\log_b 2)^2$

9) $\log_b 30$

10) $\log_b 350$

9) $\log_b \frac{70}{b}$

$\log_b \dfrac{1}{3}$

10) $(\log_b 2)(\log_b 3)$

True or false

- It is possible to take the log of a negative number.
- A log can be zero.
- $\log(a + b) = \log(a) \log(b)$

Solve the equation for x:

1) $\log(x+1) = \log(2x)$

2) $\log_5 x = 2\log_5 3$

3) $\log_2 x^2 = 3 + \log_2 x$

4) $5(3^x) = 4^x$

5) $3\log_2 x + \log_2 27 = 3$

Advanced Problems:

Simplify the expression:

1) $\log_{49} 7 - \log_8 64$

2) $\dfrac{\log_3 \sqrt{243\sqrt{81\sqrt[3]{3}}}}{\log_2 \sqrt[4]{64} + \ln e^{-10}}$

Solve for x and completely simplify your answer:

3) $\log_{x-1}(4x-4) = 2$

4) $2\log_b x = 2\log_b(1-a) + 2\log_b(1+a) - \log_b\left[\left(\dfrac{1}{a} - a\right)^2\right]$

5) $\log_b x = 2 - a + \log_b\left(\dfrac{a^2 b^a}{b^2}\right)$