Name: _____ Date: _____ **Unit 7 Class Work**

Properties of Logarithms Class Work

Objective: *You will be able to simplify and expand logarithms.*

When the bases of logarithms are identical, the following properties hold…

- $\log_b M + \log_b N =$

  Example:

- $\log_b M - \log_b N =$

  Example:

- $\log_b M^a =$

  Example:

Can you create a rule for the following logarithms, for any given values x and y?

- **$\log_x x =$**
- **$\log_y 1 =$**

Practice: Write an equivalent expression to condense each logarithm.

1. $\log_3 2x + \log_3(x - 4)$

2. $\log_{12} 17 - \log_{12}(2x + 5)$

3. $\log_2 4^x$

4. $3\log(xyz) + \log(y)$

5. $\log(p) + \log(q) - \log(r)$

6. $4\log(xy) - 6\log(y) + \log(x)$

7. $\log_7 b - 5(2\log_7 c + \log_7(3d))$

8. $\ln(6x^2) - \ln(2x)$

9. $\ln(4x)^2 + \ln(2) - \ln(x)$

10. $\log(3w) - 2(3\log(v) + \log(3t))$

11. $\log_9 \frac{1}{3} + 4\log_9 3$

12. $\log_{16}(¼) + 3\log_{16} 4$

13. $4\log 2 + \log 7 - \log 4$

14. $\ln 8 - 3*\ln 2$

Practice: Write an equivalent expression to expand each logarithm.

15. $\log_4(3\sqrt{x})$

16. $\log_3(8*(3x - 1)^2)$

17. $\log_8(2*(4y + 5)^4)$

18. $\log_{11}(4\sqrt{5})$

19. $\log_4 \sqrt{\frac{3w}{z}}$

20. $\log_8 \sqrt{\frac{s}{6r}}$

Exit Slip: Write an equivalent expression for each logarithm.

1. $\log 2x + \log x - \log 8$
2. $4\log 3x - \log 9$
3. $\log(3*(2x + 1)^2)$

Homework: pages 442-444

#11-27 odds only, 43, 59, 63, 67, 75, 91, 93

These Two Problems:

A. Condense $\log(9h) - 8(2\log(f) + \log(3h))$

B. Expand $\log\left(2\sqrt{\frac{w}{4z}}\right)$

Throwback: p. 444 #103 and 105