Algebra 2 Name_____

Properties of Logs and More Logarithmic Equations

Date_____ Period____

Expand each logarithm.

1) $\log_3 \left(5\sqrt{7 \cdot 6}\right)$

2) $\log_8 \left(z\sqrt{x \cdot y}\right)$

3) $\log_2 \sqrt{x \cdot y \cdot z}$

4) $\log_2 \left(z^4\sqrt{x}\right)$

5) $\ln \left(11^5 \cdot 2^3\right)$

Condense each expression to a single logarithm.

6) $6\log_7 u + 2\log_7 v$

7) $\frac{\log_2 x}{2} + \frac{\log_2 y}{2} + \frac{\log_2 z}{2}$

8) $2\log_5 3 + \frac{\log_5 10}{3}$

9) $3\log_6 c + \frac{\log_6 a}{2}$

10) $4\log_4 11 - 4\log_4 10$

Solve each equation. Round your answers to the nearest ten-thousandth.

11) $\log_5 5x + \log_5 3 = 2$

12) $\log_9 3x + \log_9 3 = 3$

13) $\log_5 2x + \log_5 9 = 1$

14) $\log_9 -4x - \log_9 8 = 1$

15) $\log_8 (x + 6) + \log_8 5 = 2$

16) $\log_3 10 + \log_3 (x - 4) = \log_3 45$

17) $\log_9 7 + \log_9 (x + 8) = 1$

18) $\log_4 8 + \log_4 (x + 7) = 5$

19) $\log_9 (x - 9) - \log_9 4 = \log_9 45$

20) $\log_4 (x + 2) - \log_4 6 = 1$