Math 3H   Name_____

Unit 10 Review Logarithm   Period____

Rewrite each equation in exponential form.

1) $\log_x \dfrac{15}{41} = y$

2) $\log_{20} p = 9$

Rewrite each equation in logarithmic form.

3) $x^6 = 99$

4) $x^y = 171$

Use the properties of logarithms to evaluate the expression without a calculator.

5) $\log_6 36$

6) $\log_5 5^{x-3}$

7) $\log 1$

8) $3^{\log_3 6x}$

9) $e^{\ln x^3}$

10) $\log_8 8$

Solve the following equations.

11) $\log_6 x = 2$

12) $\log_x \dfrac{1}{625} = -2$

13) $3^4 = 9^{4-x}$

14) $\left(\dfrac{1}{16}\right)^{x+4} = 64^2$

Expand each logarithm.

15) $\log_6 \left(z^2 \sqrt[3]{x}\right)$

16) $\log_9 \dfrac{x^3}{y^5}$

17) $\log_3 \left(u \cdot v \cdot w^6\right)$

18) $\ln \left(\dfrac{u}{v^6}\right)^2$

Condense each expression to a single logarithm.

19) $\ln x + \ln y + 2\ln z$

20) $6\log_5 7 - 18\log_5 12$

21) $5 \log_2 12 - 5 \log_2 5$

22) $\ln 8 + \ln 5 - 4 \ln 11$

Use a calculator to approximate each to the nearest thousandth.

23) $\ln 26$

24) $\log 50$

25) $\log_7 -52$

26) $\log_4 37$

Solve each equation.

27) $\log_8 9 + \log_8 (x - 5) = \log_8 45$

28) $\log_8 2 - \log_8 (x - 3) = 1$

29) $\log_3 4x - \log_3 5 = \log_3 36$

30) $\log_5 (x - 9) + \log_5 8 = \log_5 64$

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

31) $-5 \cdot 10^{8n} = -78$

32) $e^{-m} - 2 = 77$

33) $11^{-8m} - 10 = 64$

34) $7 \cdot 20^{8n} = 30$

Find the inverse of each function.

35) $y = \ln x^5$

36) $y = \log_5 (x - 4)$

37) $y = 4^x - 9$

38) $y = 3^x - 10$

Solve each equation.

39) $5^{2x} - 5^x - 12 = 0$

40) $e^{4x} - 5e^{2x} - 36 = 0$