Logarithms Practice Exam

1) Write the following in exponential form $\log_9 27 = \frac{3}{2}$

2) Write each of the following in logarithmic form $16^{1/4} = 2$

Evaluate each of the following logarithms without the use of a calculator.

3) $\log_4 \frac{1}{2} =$ **4)** $\log_8 4 =$ **5)** $\log_3 81 =$ **6)** $\log_4 0 =$

Write each of the following as the sum or difference of logarithms.

7) $\log \sqrt[4]{(x+1)^3 (x-2)^2}$

8) $\log_5 \frac{6x^2}{11y^5 z}$

9) $\log_2 \frac{\sqrt[5]{3(x+2)^3}}{x-1}$

10) $\log_3 \frac{\sqrt{5x^5 y^3}}{\sqrt[3]{z^2}}$

Rewrite each of the following logarithmic expressions using a single logarithm.

11) $\frac{1}{3}\log 6 + \frac{1}{3}\log x + \frac{2}{3}\log y$

12) $\ln(x+3) - \ln(2x+5) + 2\ln(x-1)$

13) $3\log_4 x - 5\log_4 y + 2\log_4 z$

14) $\log_3(x+2) + \log_3(x-2) - \log_3(x+4)$

Use the following information, to approximate the logarithm to 4 significant digits by using the properties of logarithms.

$\log_a 2 \approx 0.3562, \quad \log_a 3 \approx 0.5646, \quad$ *and* $\quad \log_a 5 \approx 0.8271$

15) $\log_a 18$ **16)** $\log_a \frac{4}{9}$ **17)** $\log_a 100$

Using a calculator, evaluate each of the following. Round all answers to three decimal places.

18) $\log_3 12$ **19)** $\log_6 17$ **20)** $\log_3 \frac{1}{5}$ **21)** $\log_4 8$

Solve each of the following logarithmic equations. **(Round any solutions with decimals to three decimal places)**
Always check for extraneous roots!!!

22) $\log_3(x+5)+\log_3(x+3)=\log_3 35$ **23)** $2\log_3 x-\log_3(x-2)=2$

24) $\log_2(x+3)+\log_2(x-3)=4$ **25)** $2-6\ln x=10$

Solve each of the following exponential equations. Round solutions to three decimal places.

26) $12^{3x+1}=7^2$ **27)** $12^{3x-2}=8^{5x+1}$ **28)** $2-4e^{2x-1}=12$

Answer each of the following.

29) If you invest \$5000 in an account that pays 12% interest, compounded quarterly, how much would you have at the end of 15 years?

30) How much would you have to invest in an account that pays 5% interest, compounded continuously, to have a balance of \$30,000 at the end of 15 years?

31) How long will it take for an investment of \$2,000 in an account that pays $4\frac{1}{2}$% interest compounded quarterly to become \$12,000.