You Can WS (Part 1) ALG2CP

**Unit 7 - Exponential and Logarithmic Functions**

Calculator allowed. *HOWEVER, for problems marked NC (No-Calculator), you MUST show work that demonstrates an understanding of how to do the problems without a calculator*.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Use property of equality of exponents to solve exponential equations. (NC)**

Solve each equation.

 1) $4^{x + 35}$ = $64^{x – 3}$ $2) \left(\frac{1}{4}\right)^{2x + 2}$ = $ 64^{x – 1}$

**Use the definition of a log to translate between exponential and log form (no work needed). (NC)**

Write each equation in exponential form. Write each equation in logarithmic form.

$ 3) log\_{6}$ 216 = 3 4) $log\_{3}$ $\frac{1}{81}$ = –4 $ 5) 7^{0}$ = 1 6) $3^{4}$ = 81

Evaluate each expression.

$7) log\_{3}$ 81 $ 8) log\_{10}$ 0.0001 $9) log\_{2}$ $\frac{1}{16}$ 10) $log\_{\frac{1}{3}}$ 27

$11) log\_{9}$ 1 12) $log\_{8}$ 4 13) $log\_{7}$ $\frac{1}{49}$ 14) $log\_{6}$ $6^{4}$

**Use properties of logarithms to evaluate and approximate logarithmic expressions. (NC)**

 Use $log\_{10}$ 5 ≈ 0.6990 and $log\_{10}$ 7 ≈ 0.8451 to approximate the value of each expression.

$15) log\_{10}$ 35 $16) log\_{10}$ 25 $17) log\_{10}$ $\frac{7}{5}$

**Use properties of logarithms to solve logarithmic and exponential equations. (NC)**

$ 18) log\_{7}$ *n* = $\frac{2}{3}$ $log\_{7}$ 8 19) $log\_{2}$ (5*y* + 2) – 1 = $log\_{2}$ (1 – 2*y*)

 20)$log\_{8}$ 48 – $log\_{8}$ *w* = $log\_{8}$ 4 $21) log\_{3}$ (*a* + 3) + $log\_{3}$ (*a* + 2) = $log\_{3}$ 6

 22) $ log\_{4}$ ($x^{2}$ – 4) – $log\_{4}$ (*x* + 2) = $log\_{4}$ 1 23) $log\_{8}$ (*n* – 3) + $log\_{8}$ (*n* + 4) = 1

 24) 3*x* – 5 = $log\_{2}$ 1024 $ 25) log\_{13}$ ($x^{2}$ – 4) = $log\_{13}$ 3*x*

You Can WS (Part 2) ALG2CP

**Unit 7 - Exponential and Logarithmic Functions**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Work with common logs and natural logs.**

Write an equivalent exponential or logarithmic equation. (NC)

 1) ln 50 = *x* 2) ln 36 = 2*x* 3) log 100 = 2

 $ 4) e^{x}$ = 8 $ 5) e^{5}$ = 10*x* $6) 10^{5}$ = 100000

**Solve logarithmic and exponential applications. (Calculator OK, but still show work)**

Solve each equation. Round to four decimal places. (Save calculator for the last step)

$ 7) e^{-4x}$ = 5 8) 2$e^{5x}$= 24 9) 2$e^{x}$– 3 = 1

 10) ln (*x* + 2) = 3 11) 2ln (–2*x*) = 7 12) ln 3*x* + ln 2*x* = 9

**Graph exponential and logarithmic functions, identifying key features such as domain and range, intervals of increasing and decreasing, end behavior, asymptotes, and intercepts. (NC)**

Graph the following and state the domain and range, intervals of increasing and decreasing, intercepts, asymptotes, and end behavior.

 13) $f\left(x\right)=3^{x}$ $14) f\left(x\right)=\left(\frac{1}{5}\right)^{x}$ 15) $f\left(x\right)=log\_{8}x$ 16) $f\left(x\right)=log\_{3}x$

**Evaluate logs with a calculator. Express a log with a base other than *10* or *e* in terms of common logs and use a calculator to approximate its value (change of base formula).**

Use a calculator to evaluate each expression to the nearest ten-thousandth.

 17) log 101 18) ln 0.05

Express each logarithm in terms of common logarithms. Then approximate its value to the nearest ten-thousandth. (Calculator ok, show change of base formula)

 19) $log\_{9}$ 6 $20) log\_{7} \sqrt{8}$