Algebra 2/Trigonometry Name: _____
UNIT 7: Exponential & Logarithmic Functions - REVIEW Date: _____

NC: Non-Calculator C: Calculator Permitted

Section 1: Given each function, provide an example of a graph that will match each description (NC). Then, graph only the exponential equations (all f(x) equations).

1.) DESCRIPTION	$f(x) = 3^x$	$g(x) = \log(x)$
a) Horizontal shift LEFT 3 units		
b) Horizontal shift RIGHT 2 units		
c) Vertical shift UP 4 units		
d) Vertical shift DOWN 5 units		
e) Reflection over the x-axis		
f) Reflection over the y-axis		

Section 2: Rewrite each exponential equation in logarithmic form (NC).

2.) $5^x = 625$ 3.) $10^x = 1000$ 4.) $e^3 = 20.085$ 5.) $u^v = w$

Section 3: Rewrite each logarithmic equation in exponential form (NC).

6.) $\log_2 \frac{1}{8} = -3$ 7.) $\ln 143 = x$ 8.) $\log_4 64 = 3$ 9.) $\log \frac{1}{100} = -2$

Section 4: Evaluate (NC - #10 – 15. C - #16 – 18 Round to the nearest thousandths).

10.) $\log_4 4^2 =$ _____ 11.) $\ln e^3 =$ _____ 12.) $\log 10^2 =$ _____

13.) $2^{\log_2 5} =$ _____ 14.) $e^{\ln 12} =$ _____ 15.) $10^{\log 4} =$ _____

16.) $\log_3 8 =$ _____ 17.) $\log_5 12 =$ _____ 18.) $\log_2 7 =$ _____

Section 5: Expand each logarithmic expression. Your answer may not contain any exponents or radicals (NC).

19.) $\log\left(\frac{x^3\sqrt{y+1}}{z^2}\right)$ 20.) $\ln\left(\frac{yz\sqrt{x}}{w}\right)$

Section 6: Condense each logarithmic expression (NC).

21.) $3\log x + 2\log y + \frac{1}{2}\log z$ 22.) $3\ln x + 2\ln 5 - \ln(x+2)$

For additional practice from each section on this review sheet – see the Unit 7 Additional Practice PDF (with answer key) posted on my website!

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Section 7: Solving Exponential Equations (C). Round any irrational answers to the nearest thousandths.

23.) $3^{x-2} = 27$ 24.) $e^{x+5} = e^7$ 25.) $4^x = 42$

26.) $4(5^{x+2}) = 32$ 27.) $e^x = 18$ 28.) $3e^x = 24$

Section 8: Solving Logarithmic Equations (C). Round any irrational answers to the nearest thousandths.

29.) $\log_4(x-1) = 2$ 30.) $\ln x = 2$

31.) $\log x = 6$ 32.) $\log_3(x+5) = 5$

33.) $\log_3 x + \log_3(x-8) = 2$ 34.) $\log_4 x - \log_4(x-1) = \frac{1}{2}$

35.) $\log_3(5x-1) = \log_3(x+7)$ 36.) $\log_6(3x+14) - \log_6 5 = \log_6 2x$

Section 9: Application Problems (C).

Simple Compound Interest: $\boldsymbol{A = P\left(1 + \frac{r}{n}\right)^{nt}}$

Continuous Compound Interest: $\boldsymbol{A = Pe^{rt}}$

37.) Emily plans to put her graduation money into an account and leave it there for 4 years while she goes to college. She receives $1,050 in graduation money to college that she puts into an account that earns 4.25%. How much money will be in Emily's account at the end of four years if it is compounded?

a.) Quarterly? b) Monthly? c) Continuously?

38.) The number of people infected by the flu in a particular region after t hours is given by: $P(t) = 5e^{0.03t}$ where $t \geq 0$.

a.) Is this a growth or decay problem?
b.) What is the initial population of people infected by the flu?
c.) What is the population of people infected by the flu after 12 hours?
d.) What is the population of people infected by the flu after 1 day?

39.) The population of mosquitoes after t days is given by: $P(t) = 500e^{-0.055t}$ where $t \geq 0$.

a.) Is this a growth or decay problem?
b.) What is the initial population of mosquitoes?
c.) What is the population of mosquitoes after 1 day?
d.) What is the population of mosquitoes after 72 hours?

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