Name Key Date _____ Pd _____

6.1 – 6.4 Quiz Review CYU

☑ *Use when you get it right all by yourself*

S *Use when you did it all by yourself, but made a silly mistake*

H *Use when you could do it alone with a little help from teacher or peer*

G *Use when you completed the problem in a group*

X *Use when a question was attempted but wrong (get help)*

N *Use when a question was not even attempted*

CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Determining growth or decay	1, 2a		
Identifying the pivot point (PP)	1		
Horizontal asymptotes (HA)	1		
Vertical asymptotes (VA)	8		
Growth/Decay factor, b	1, 2b		
Growth/Decay rate, r	1, 2b		
Domain/Range in interval notation	1		
Exponential graphs	1, 2c		
Creating t-charts	1		
Real-world application	2c	4c, 4d	
Simplifying natural base "e"	3		
Compounded Continuously: $A = Pe^{rt}$		4b	
Compound Interest: $A = P(1 \pm \frac{r}{n})^{nt}$		4a	
Converting between inverses "I heart LOGS"	5		
Evaluating logarithms	6		
Solving logarithms: creating the same base		7	
Describing transformations		8	
Writing rules given transformations		9	

Quiz 6.1 – 6.4 Study guide list:

1. I heart logs, inverse functions
2. I heart logs, inverse functions
3. Evaluate exponential & logarithmic expressions
4. Evaluate exponential & logarithmic expressions
5. Evaluate exponential & logarithmic expressions
6. Evaluate exponential & logarithmic expressions
7. Evaluate exponential & logarithmic expressions
8. Evaluate exponential & logarithmic expressions
9. Solve an exponential equation
10. Solve an exponential equation
11. Graph, PP, HA/VA, t-charts , transformations, & EB of logarithmic & exponential functions
12. Graph, PP, HA/VA, t-charts , transformations, & EB of logarithmic & exponential functions
13. Writing an equation based on transformations
14. Determining the transformations from a parent function
15. Determining growth/decay, HA/VA, factors, rates, domain & range in interval notation
16. Simplifying expressions using exponential properties
17. ACT SPIRAL fractions.
18. ACT SPIRAL mean, median, mode.
19. ACT SPIRAL geometry: coordinates on a standard (x, y) plane.
20. ACT SPIRAL annual interest rate.

$b = 1 + r$

6.1: Exponential Growth & Exponential Decay

1. Tell whether the function represents exponential growth or decay. Identify the pivot point (PP), asymptote, factor, rate, and domain and range in interval notation. Then sketch a graph. Use a t-chart to show the points you are using to graph. PP must be one of the four points.

a. $f(x) = 7^x$

Growth/Decay PP (0, 1)

HA/VA $y = 0$

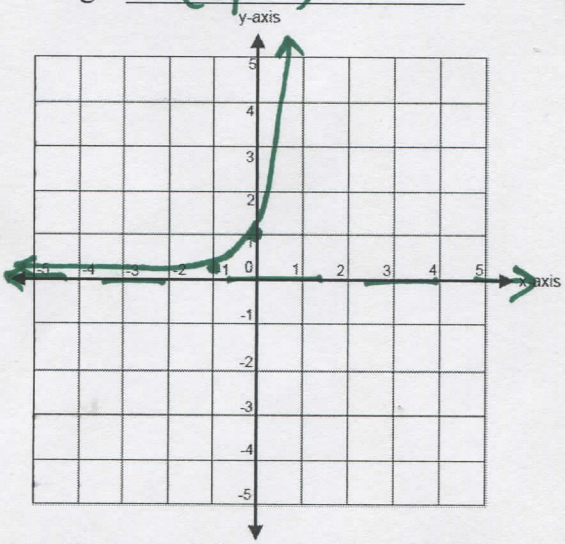
b G/D Factor 7

r G/D Rate 6

Domain: $(-\infty, \infty)$

Range: $(0, \infty)$

x	y
−1	0.143
0	1
1	7



b. $g(x) = (0.5)(1.8)^x$

Growth/Decay PP (0, 0.5)

HA/VA $y = 0$

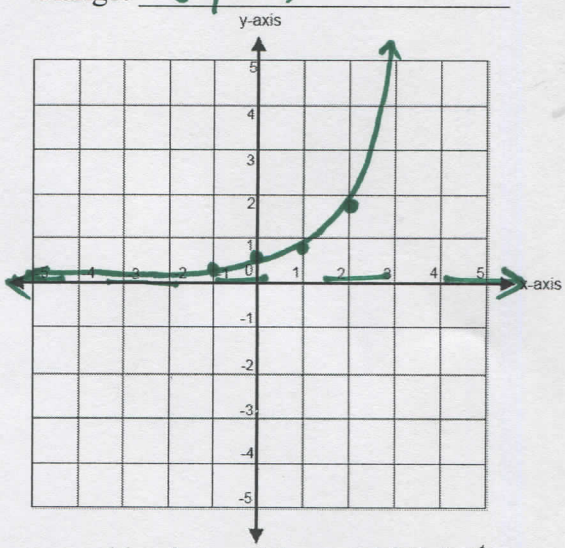
b G/D Factor 1.8

r G/D Rate 0.8

Domain: $(-\infty, \infty)$

Range: $(0, \infty)$

x	y
−1	0.278
0	$\frac{1}{2}$
1	0.9
2	1.62



2. The value of a rare coin y (in dollars) can be approximated by the model $y = 0.25(1.06)^t$, where t is the number of years since the coin was minted.

a) Tell whether the model represents exponential growth or decay.

$b > 1$

$b = 1.06$

b) Identify the annual percent increase or decrease (growth/decay rate) in the value of the coin.

$r = 0.06$ 6%

c) Estimate the number of years it will take for the value of the coin to reach $0.60.

$y_1 = 0.60$

$y_2 = 0.25(1.06)^t$

After 15 yrs

6.2: Natural Base "e"

*3. Simplify each expression. Provide an exact **and** approximate answer when possible.*

a. $e^{2x} \cdot e^{5} \cdot e^{x-2}$ b. $\sqrt[3]{64e^{9x}}$ c. $\frac{27e^4}{18e^7}$ d. $(5e^{-4x})^3$

e^{3x+3} $4e^{3x}$ $\frac{3}{2e^3}$ $\frac{125}{e^{12x}}$

4. You invest $5000 in an account to save for college.

a) Option 1 pays 4% annual interest compounded monthly. What would be the balance in the account after two years?

$5415.71

b) Option 2 pays 4% annual interest compounded continuously. What would be the balance in the account after 2 years?

$5416.44

c) What is the difference between the two options after 10 years?

$4.96

d) How would your answer to part (c) change if you invested $50,000?

$49.60

6.3: Logarithmic Functions

5. Rewrite the given equation in its inverse form. "I HEART LOGS!"

a. $\log_2 8 = 3$ b. $\log_7 7 = 1$ c. $4^0 = 1$ d. $6^{-1} = \frac{1}{6}$

$2^3 = 8$ $7^1 = 7$ $\log_4 1 = 0$ $\log_6 \frac{1}{6} = -1$

6. Evaluate the logarithm. If not exact, round to the thousandths. Simplify completely.

a. $\log 5$ b. $\log_5 125$ c. $\log_4 4^{3x}$ d. $8^{\log_8 2x}$ e. $\log_2 \frac{1}{8}$

≈ 0.699 3 $3x$ $2x$ -3

7. Solve the following equations for x. Check for extraneous solutions. Box your final answer.

a. $5^{3x} = 25^{x+2}$ b. $16^{x-3} = \frac{1}{8}$ c. $27 = 9^{4x-1}$

$x = 4$ $x = \frac{9}{4}$ $x = \frac{5}{8}$

6.4: Transformations of Exponential & Logarithmic Functions

8. Describe the transformations of f represented by g. Then state the asymptote.

a. $f(x) = 2^x$, $g(x) = 2^x + 3$

↑3u, y=3

b. $f(x) = 3^x$, $g(x) = 3^{x-1}$

→1u; y=0

c. $f(x) = e^x$, $g(x) = 3e^{(-x+2)}$

VS by 3; Ry; →2u; y=0

9. Write a rule for g that represents the indicated transformation of the graph of f.

a. $f(x) = e^x$; vertical compression by a factor of $\frac{1}{4}$, followed by a translation 5 units up.

$g(x) = \frac{1}{4}e^x + 5$

b. $f(x) = \log_8 x$; reflection over the y-axis, followed by a translation 4 units left

$g(x) = \log_8(-x-4)$

CYU Reflection: *How far can you go: basic, intermediate, or advanced?*

Rate your mastery level!

How confident are you with the skills this CYU covered? Circle the score you would give yourself.