

KEY

12.4-12.5 Logarithmic Functions Quiz Review

Period _____ Date _____

PLEASE READ CAREFULLY: The following quiz will assess all of the I CAN statements we've been working on in sections 12.4-12.5. When applicable, please transfer your answers to the lines provided on the right.

1. Given $\log_d g = c$, match each vocabulary term with the appropriate variable or expression.

Base: d Exponent: c Power: g

2. List the restrictions OR describe all the possible values for each of the variables in $\log_d g = c$. (*Hint: Is there any value that c cannot possibly be? d? g?*)

g: $g > 0$

d: $d > 0$ and $d \neq 1$

c: All Real Numbers

3. When you are evaluating a logarithm, what are you solving for? That is, what does your answer represent?

The solution represents an exponent.

Rewrite the following equations in *exponential form*.

4. $\log_5 5 = 1$

4. $5^1 = 5$

5. $\log_{\frac{1}{3}} 81 = -4$

5. $\frac{1}{3}^{-4} = 81$

Rewrite the following equations in *logarithmic form*.

6. $25 = 5^2$

6. $\log_5 25 = 2$

7. $9^3 = 729$

7. $\log_9 729 = 3$

Evaluate each logarithm.

8. $\log_3 27 = x$

$3^x = 27$

$3^x = 3^3$

9. $\log_4 \frac{1}{64} = x$

$4^x = \frac{1}{64}$

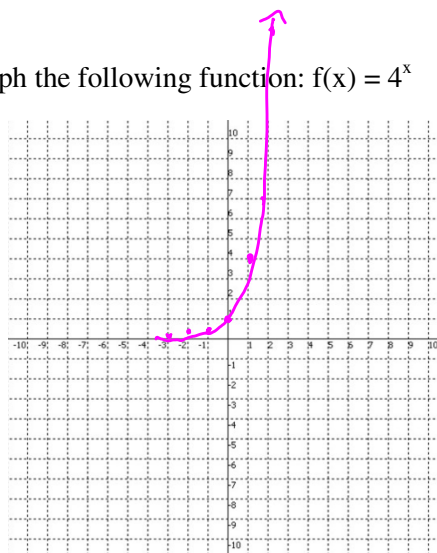
$4^x = 4^{-3}$

8. $x = 3$

9. $x = -3$

10. Complete the provided table of values and graph the following function: $f(x) = 4^x$

x	y
-3	$\frac{1}{64}$
-2	$\frac{1}{16}$
-1	$\frac{1}{4}$
0	1
1	4
2	16
3	64



11. List all the key characteristics of the exponential function $f(x) = 4^x$.

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

y-intercept: $(0, 1)$

Range: $(0, \infty)$

x-intercept(s): None

Interval of Increasing/Decreasing: $(-\infty, \infty)$

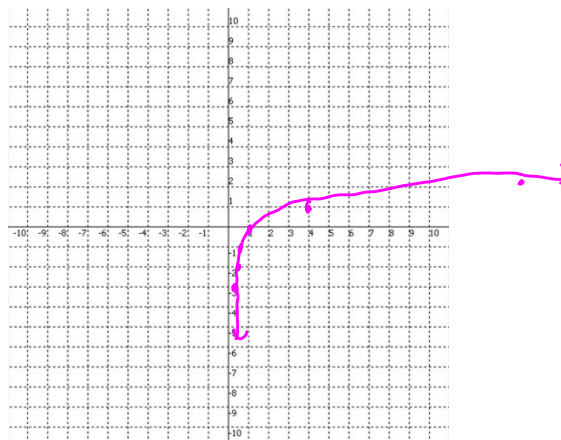
Asymptote(s): $y = 0$

End Behavior: $\lim_{x \rightarrow -\infty} f(x) = 0$

$\lim_{x \rightarrow +\infty} f(x) = \infty$

12. Graph the inverse function of $f(x) = 4^x$.

x	y
$\frac{1}{64}$	-3
$\frac{1}{16}$	-2
$\frac{1}{4}$	-1
1	0
4	1
16	2
64	3



13. List all the key characteristics of the inverse function. (Which is actually $g(x) = \log_4(x)$)

Domain: $(0, \infty)$

y-intercept: None

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

x-intercept(s): $(1, 0)$

Interval of Increasing/Decreasing: $(0, \infty)$

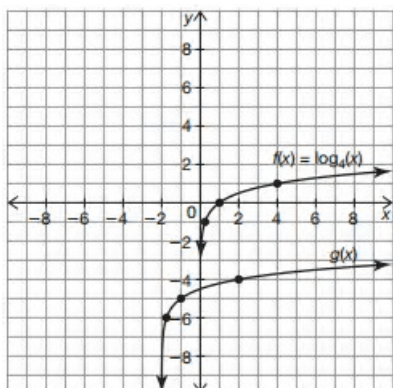
Asymptote(s): $x = 0$

End Behavior: $\lim_{x \rightarrow 0^+} g(x) = -\infty$

$\lim_{x \rightarrow +\infty} g(x) = \infty$

Analyze the graphs of $f(x)$ and $g(x)$. Identify any transformations and write a function for $g(x)$.

14.

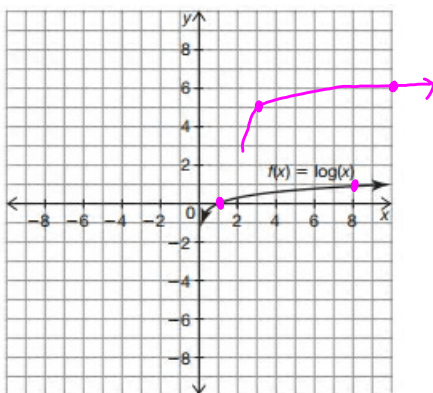


14. $g(x) = \underline{f(x+2) - 5}$

Down 5
Left 2

The graph of $f(x) = \log(x)$ is shown. Use the graph of $f(x)$ to sketch the transformed function $m(x)$ on the coordinate plane. Then, state the domain, range and asymptotes of $m(x)$.

15. $m(x) = f(x - 2) + 5$



15a. Domain: $\underline{(2, \infty)}$

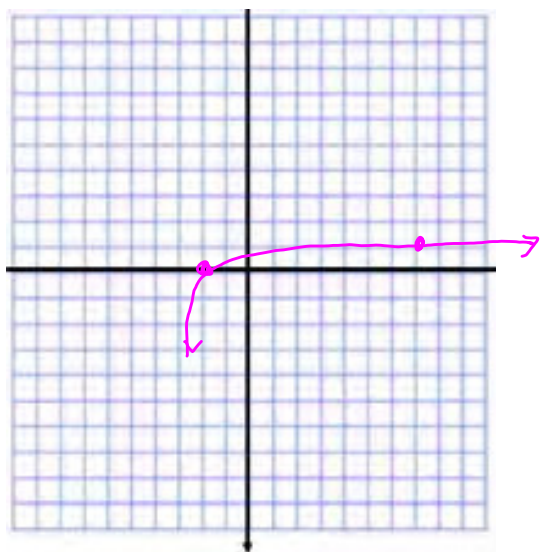
15b. Range: $\underline{(-\infty, \infty)}$

15c. Asymptote: $\underline{x = 2}$

Graph the following logarithm and describe its characteristics.

16. $f(x) = \log(x + 3)$

-2, 0
7 |



16a. Domain: $\underline{(-3, \infty)}$

16b. Range: $\underline{(-\infty, \infty)}$

16c. End Behavior: $\underline{\lim_{x \rightarrow \infty} f(x) = \infty}$

16d. Asymptote: $\underline{x = -3}$

16e. Asymptotic Behavior: $\underline{\lim_{x \rightarrow -3^+} f(x) = -\infty}$