Student: _____	**Instructor:** Keith Barrs	**Assignment:** Practice Problems for Test 4 (NEW SP12)
Date: _____	**Course:** Math-1111-TR-12:30-SP12	
Time: _____	**Book:** Sullivan: College Algebra, 8e	

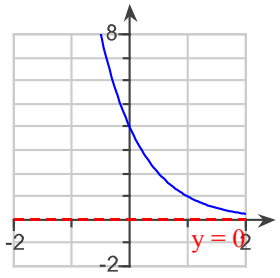
1. Match the graph to one of the following functions.

A. $y = 4^x$ B. $y = 4^{-x}$

C. $y = -4^x$ D. $y = -4^{-x}$

E. $y = 4^x - 1$ F. $y = 4^{x-1}$

G. $y = 4^{1-x}$ H. $y = 1 - 4^x$



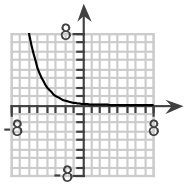
Which function is represented by the graph?

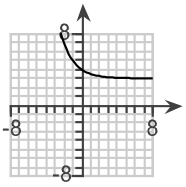
☐ (Type A, B, C, D, E, F, G, or H.)

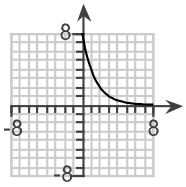
2. Use transformations to identify the graph of the function. Then determine its domain, range, and horizontal asymptote.

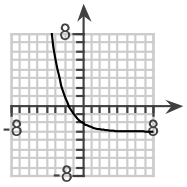
$f(x) = 2^{-x} - 3$

Identify the graph of $f(x) = 2^{-x} - 3$.

○A. 

○B. 

○C. 

○D. 

What is the domain of $f(x) = 2^{-x} - 3$?

☐ (Type your answer in interval notation.)

What is the range of $f(x) = 2^{-x} - 3$?

☐ (Type your answer in interval notation.)

What is the horizontal asymptote of $f(x) = 2^{-x} - 3$?

$y =$ ☐

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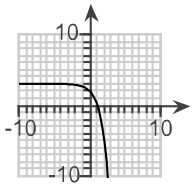
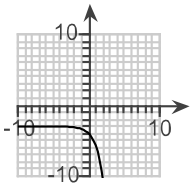
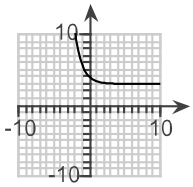
3. Use transformations to identify the graph of the function. Then determine its domain, range, and horizontal asymptote.

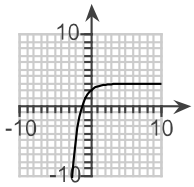
$f(x) = 3 - e^{-x}$

Identify the graph of $f(x) = 3 - e^{-x}$.

○A. 

○B. 

○C. 

○D. 

What is the domain of $f(x) = 3 - e^{-x}$?

☐ (Type your answer in interval notation.)

What is the range of $f(x) = 3 - e^{-x}$?

☐ (Type your answer in interval notation.)

What is the horizontal asymptote of $f(x) = 3 - e^{-x}$?

$y =$ ☐

4. Solve the equation.

$$\left(\frac{3}{5}\right)^{x} = \left(\frac{27}{125}\right)$$

$x =$ ☐

(Simplify your answer. Type an integer or a fraction.)

5. Solve the equation.

$2^{4x+1} = 8$

$x =$ ☐

(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)

6. Change the exponential expression to an equivalent expression involving a logarithm.

$3.4 = a^{8}$

The equivalent logarithmic expression is ☐.

(Type an equation. Use integers or decimals for any numbers in the equation.)

7. Change the logarithmic expression to an equivalent expression involving an exponent.

$\log_2 16 = x$

The equivalent exponential expression is ☐. (Type an equation.)

8. Find the exact value of the logarithm without using a calculator.

$\log_4 64$

$\log_4 64 =$ ☐

9. Find the domain of the function.

$f(x) = \ln(x - 3)$

The domain of f is ☐.

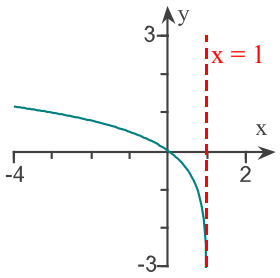
(Type your answer in interval notation.)

10. Use a calculator to evaluate the expression.

$$\frac{\ln \frac{24}{17}}{0.07}$$

$$\frac{\ln \frac{24}{17}}{0.07} \approx \square$$ (Round your answer to three decimal places.)

11. The graph of a logarithmic function is given. Match the graph to its function.



Which function matches the graph?

A. $y = \log_4(x-1)$
B. $y = 1 - \log_4 x$
C. $y = -\log_4 x$
D. $y = \log_4 x - 1$
E. $y = -\log_4(-x)$
F. $y = \log_4(-x)$
G. $y = \log_4 x$
H. $y = \log_4(1-x)$

12. Solve the equation.

$$\log_4 x = 2$$

$x = \square$

13. Solve the equation.

$$\log_2(7x+5) = 4$$

$x = \square$ (Type an integer or a simplified fraction.)

14. Solve the equation.

$e^{8x} = 3$

x = ☐
(Type an exact answer.)

15. Use properties of logarithms to find the exact value of the expression. Do not use a calculator.

$\log_6 24 - \log_6 4$

$\log_6 24 - \log_6 4$ = ☐ (Type an integer or a simplified fraction.)

16. Suppose that $\ln 2 = r$ and $\ln 9 = s$. Use properties of logarithms to write the logarithm in terms of r and s.

$\ln 4.5$

$\ln 4.5$ = ☐

17. Write the expression as a sum and/or difference of logarithms. Express powers as factors.

$\log_7(343x)$

$\log_7(343x)$ = ☐ (Type an exact answer in simplified form.)

18. Write the expression as a single logarithm.

$6 \log_7 u + 7 \log_7 v$

$6 \log_7 u + 7 \log_7 v$ = ☐ (Simplify your answer.)

19. Write the expression as a single logarithm.

$\log_4(x^2 - 4) - 5 \log_4(x + 2)$

$\log_4(x^2 - 4) - 5 \log_4(x + 2)$ = ☐
(Simplify your answer.)

20. Use the change-of-base formula and a calculator to evaluate the logarithm.

$\log_2 14$

$\log_2 14 =$ ☐

(Do not round until the final answer. Then round to the nearest thousandth as needed.)

21. Use the change-of-base formula and a calculator to evaluate the logarithm. Round your answer to three decimal places.

$\log_{1/5} 7$

$\log_{1/5} 7 \approx$ ☐

(Do not round until the final answer. Then round to three decimal places as needed.)

22. Solve the following logarithmic equation.

$\log_4(3x) = 2$

Select the correct choice below and fill in any answer boxes in your choice.

○ A. $x =$ ☐

(Simplify your answer. Type an exact answer, using radicals and log functions as needed. Use a comma to separate answers as needed.)

○ B. There is no solution.

23. Solve the following logarithmic equation.

$3 \log_2 x = -\log_2 8$

Select the correct choice below and fill in any answer boxes in your choice.

○ A. $x =$ ☐

(Simplify your answer. Type an exact answer, using radicals and log functions as needed. Use a comma to separate answers as needed.)

○ B. There is no solution.

24. Solve the following logarithmic equation.

$$\log_2(x+11) + \log_2(x+18) = 3$$

Select the correct choice below and fill in any answer boxes in your choice.

○ A. $x =$ ☐
(Simplify your answer. Type an exact answer, using radicals and log functions as needed. Use a comma to separate answers as needed.)

○ B. There is no solution.

25. Solve the equation.

$$5^x = 3$$

Select the correct choice and fill in any answer boxes in your choice below.

○ A. $x =$ ☐
(Type an exact solution, using radicals and log functions as needed. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

○ B. There is no solution.

26. Solve the equation.

$$6^{1-9x} = 5^x$$

Select the correct choice and fill in any answer boxes in your choice below.

○ A. $x =$ ☐
(Type an exact solution, using radicals and log functions as needed. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

○ B. There is no solution.

27. Find the amount that results from the given investment.

$200 invested at 2% compounded quarterly after a period of 2 years

After 2 years, the investment results in $☐.
(Round to the nearest cent as needed.)

28. If Tanisha has $ 100 to invest at 8% per annum compounded quarterly, how long will it be before she has $ 150? If the compounding is continuous, how long will it be?

Compounding quarterly, it will be about ☐ years before Tanisha has $ 150.
(Round to two decimal places as needed.)

Compounding continuously, it will be about ☐ years before Tanisha has $ 150.
(Round to two decimal places as needed.)

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1. G

2. D
$(-\infty,\infty)$
$(-3, \infty)$
-3

3. D
$(-\infty,\infty)$
$(-\infty, 3)$
3

4. 3

5. $\frac{1}{2}$

6. $8 = \log_a 3.4$

7. $16 = 2^x$

8. 3

9. $(3,\infty)$

10. 4.926

11. H

12. 16

13. $\frac{11}{7}$

14. $\frac{\ln 3}{8}$

15. 1

16. $s - r$

17. $3 + \log_7 x$

18. $\log_7(u^6 v^7)$

19. $\log_4\left[\frac{(x-2)}{(x+2)^4}\right]$

20. 3.807

21. -1.209

22. A, $\frac{16}{3}$

23. A, $\frac{1}{2}$

24. A, -10

25. A, $\frac{\ln 3}{\ln 5}$

26. A, $\frac{\ln 6}{9\ln 6 + \ln 5}$

27. 208.14

28. 5.12
5.07