

Student: Cole Lamers
Date: 06/23/19

Instructor: Kelly Galarneau
Course: CA&T Internet (70263)
 Galarneau

Assignment: 4.2 Logarithmic Functions

1. A logarithm with base 10 is called the _____ logarithm and a logarithm with base e is called the _____ logarithm.

A logarithm with base 10 is called the common logarithm and a logarithm with base e is called the natural logarithm.

2. Watch the video and then solve the problem given below.

[Click here to watch the video.](#)¹

Write the exponential equation $5^3 = 125$ in logarithmic form.

The exponential equation written as a logarithmic equation is $\log_5 125 = 3$.

1: <http://mediaplayer.pearsoncmg.com/assets/Ln1528LugtOCkmcguumzNPj3JhKtGies?clip=1>

3. Write the equation in its equivalent logarithmic form.

$$5^3 = 125$$

What is the equivalent logarithmic form of the equation?

$$3 = \log_5 125$$

4. Convert to a logarithmic equation.

$$2^{-3} = 0.125$$

The equivalent logarithmic equation is

$$\log_2 .125 = -3$$

(Simplify your answers. Type an integer or a decimal.)

5. Watch the video and then solve the problem given below.

[Click here to watch the video.](#)²

Write the logarithmic equation $\log_6 x = 5$ in exponential form.

The logarithmic equation written as an exponential equation is $6^5 = x$.

2: <http://mediaplayer.pearsoncmg.com/assets/Ln1528LugtOCkmcguumzNPj3JhKtGies?clip=2>

6. Convert to an exponential equation.

$$\log_5 625 = 4$$

Complete the equivalent exponential equation.

$$5^4 = 625$$

(Type your answer using exponential notation. Do not simplify.)

7. Write in exponential form.

$$\log_5 1 = 0$$

The equivalent exponential form is

$$5^0 = 1$$

(Simplify your answer. Type in exponential form.)

8. Write the following logarithmic equation in exponential form.

$$\ln 83 = 4.4188$$

$$e^{4.4188} = 83 \quad (\text{Type an equation.})$$

9. Watch the video and then solve the problem given below.

[Click here to watch the video.](#)³

Find the value of the logarithm $\log_{\frac{1}{4}} 64$.

$$\log_{\frac{1}{4}} 64 = \boxed{-3}.$$

3: <http://mediaplayer.pearsoncmg.com/assets/Ln1528LugtOCkmcguumzNPj3JhKtGies?clip=3>

10. Evaluate the expression without using a calculator.

$$\log 100$$

$$\log 100 = \boxed{2}$$

11. Find the logarithm.

$$\log_5 \frac{1}{625}$$

$$\log_5 \frac{1}{625} = \boxed{-4}$$

12. Find the logarithm.

$$\log_{16} 2$$

$$\log_{16} 2 = \boxed{\frac{1}{4}}$$

(Type a fraction.)

13. Evaluate the following expression.

$$\log_8 1$$

$$\log_8 1 = \boxed{0} \quad (\text{Simplify your answer.})$$

14. Evaluate the following expression.

$$\log_{11} 11$$

$$\log_{11} 11 = \boxed{1} \quad (\text{Simplify your answer.})$$

15. Evaluate the following expression.

$$\log_9 9^3$$

$$\log_9 9^3 = \boxed{3} \quad (\text{Simplify your answer.})$$

16. Simplify.

$$6^{\log_6(1)}$$

$$6^{\log_6(1)} = \boxed{1}$$

17. Evaluate the following expression.

$$7^{\log_7 9} + \log_3 3^{-3}$$

$$7^{\log_7 9} + \log_3 3^{-3} = \boxed{6} \text{ (Simplify your answer.)}$$

18. Find the domain of the following function.

$$f(x) = \log_2(x - 6)$$

The domain is $\boxed{(6, \infty)}$. (Type your answer in interval notation.)

19. Find the domain of the following function.

$$f(x) = \log_4 \sqrt{x - 8}$$

The domain is $\boxed{(8, \infty)}$. (Type your answer in interval notation.)

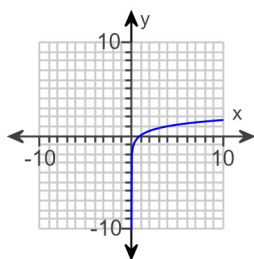
20. Watch the video and then solve the problem given below.

[Click here to watch the video.](#)⁴

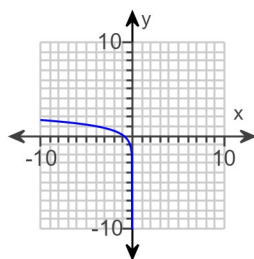
Graph the logarithmic function $y = \log_4 x$.

Choose the correct graph below.

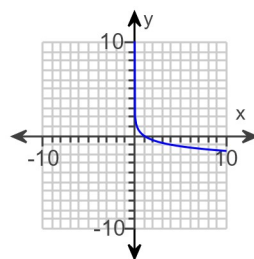
☒ A.



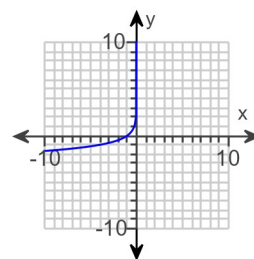
☐ B.



☐ C.



☐ D.



4: <http://mediaplayer.pearsoncmg.com/assets/Ln1528LugtOckmcguumzNPj3JhKtGies?clip=6>

21.

For the following function, briefly describe how the graph can be obtained from the graph of a basic logarithmic function. Then, graph the function and state the domain and the vertical asymptote.

$$f(x) = \log_2(x - 1)$$

Describe how the graph of $f(x)$ can be obtained from the graph of a basic logarithmic function.

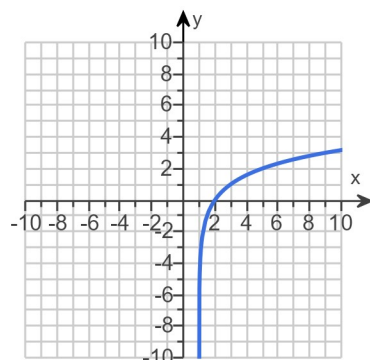
The graph of $f(x) = \log_2(x - 1)$ could be obtained by translating the graph of $y = \log_2 x$ unit(s) to the right.

Use the graphing tool to graph the equation.

What is the domain of $f(x)$?

(Type your answer in interval notation.)

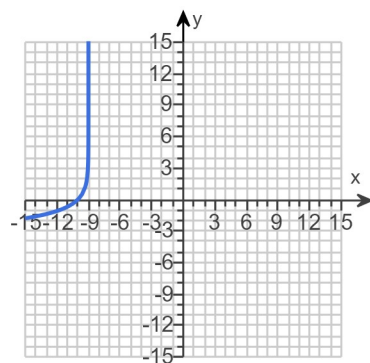
The vertical asymptote is $x =$.



22.

Begin with the graph of $y = \ln x$ and use transformations to sketch the graph of the function $y = -\ln(-9 - x)$.

Use the graphing tool to graph the equation.

23. Solve for x .

$$\log x = 2$$

The solution is $x =$.

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