

**Student:** Cole Lamers  
**Date:** 06/23/19

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

**Assignment:** 4.1 Exponential Functions

1. Is the following an exponential function?

$$y = x^4$$

Is  $y = x^4$  an exponential function?

- ☐ Yes  
☒ No

2. Is the following an exponential function?

$$y = x^3$$

Is  $y = x^3$  an exponential function?

- ☐ Yes  
☒ No

3. Given the function  $f(x) = 3^{1-x}$ , find  $f(-2)$ .

$$f(-2) = 27$$

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

4. Find the exponential function of the form  $f(x) = c \cdot a^x$  that contains the two points shown below.

(0,9) and (2,81)

$$f(x) = 9 \cdot 3^x$$

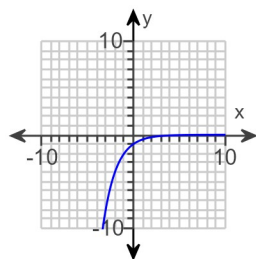
5. Watch the video and then solve the problem given below.

[Click here to watch the video.](#)<sup>1</sup>

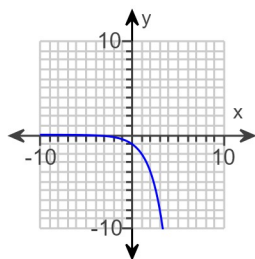
Graph the exponential function  $f(x) = 2^x$ .

Choose the correct graph below.

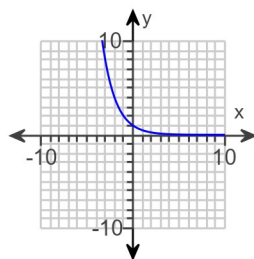
☐ A.



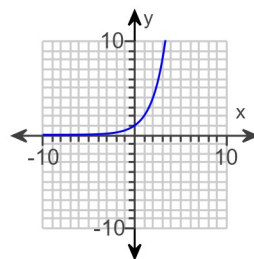
☐ B.



☐ C.



☒ D.



1: <http://mediaplayer.pearsoncmg.com/assets/IViKVvCZjrwsqAQImQjePp7wZ6QE1xgO>

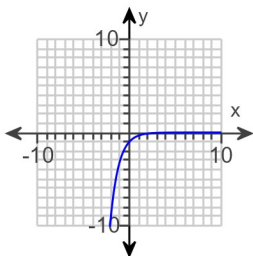
6. Watch the video and then solve the problem given below.

[Click here to watch the video.](#)<sup>2</sup>

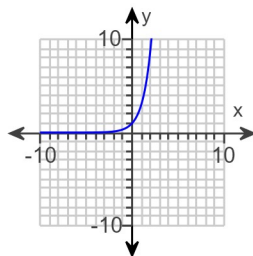
Graph the exponential function  $f(x) = \left(\frac{1}{3}\right)^x$ .

Choose the correct graph below.

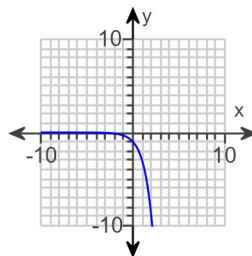
☐ A.



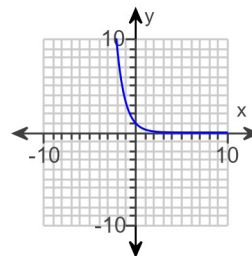
☐ B.



☐ C.



☒ D.



2: <http://mediaplayer.pearsoncmg.com/assets/IViKVvCZjrwsqAQImQjePp7wZ6QE1xgO>

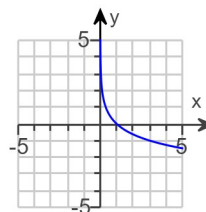
7.

Graph the function.

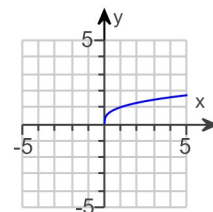
$$f(x) = \left(\frac{1}{3}\right)^x$$

Choose the correct graph.

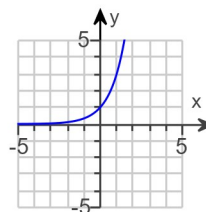
☐ A.



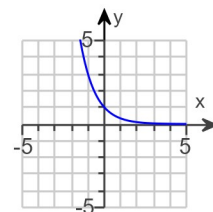
☐ B.



☐ C.



☒ D.



8. Write an equation of the graph in the final position.

The graph of  $y = 2^x$  is shifted 4 units to the left and then 6 units up.

Which of the following is the equation of the graph?

☐ A.  $y = 2^{x-4} - 6$

☐ B.  $y = 2^{x-4} + 6$

☒ C.  $y = 2^{x+4} + 6$

☐ D.  $y = 2^{x+4} - 6$

9. Using the formula for simple interest and the given values, find  $I$ .

$$P = \$2,452; r = 10\%; t = 6 \text{ months}; I = ?$$

$$I = \$ \quad 122.6 \quad (\text{Round to two decimal places.})$$

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

[Click here to watch the video.](#)<sup>3</sup>

Mykala has deposited \$5,000 in a bank for 6 years at a simple interest rate of 5%. How much money will she receive at the end of the six years?

$$\text{Mykala will receive } \$ \quad 6500 \quad .$$

3: <http://mediaplayer.pearsoncmg.com/assets/IViKVvCZjrwsqAQImQjePp7wZ6QEIXgO>

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

[Click here to watch the video.](#)<sup>4</sup>

Mykala has deposited \$5,000 in a bank for 6 years at the interest rate of 5% compounded annually. How much money will she receive at the end of the six years?

$$\text{Mykala will receive } \$ \quad 6700 \quad . (\text{Round to the nearest dollar as needed.})$$

4: <http://mediaplayer.pearsoncmg.com/assets/IViKVvCZjrwsqAQImQjePp7wZ6QEIXgO>

12. Find **(a)** the future value of the given principal  $P$  and **(b)** the interest earned in the given period.

$$P = \$3400 \text{ at } 7.5\% \text{ compounded annually for } 16 \text{ years}$$

$$\text{(a) The future value of the principal after 16 years is } \$ \quad 10814.7 \quad .$$

(Round to the nearest cent as needed.)

$$\text{(b) The interest earned in 16 years is } \$ \quad 7414.7 \quad .$$

(Round to the nearest cent as needed.)

13. Find the principal  $P$  that will generate the given future value  $A$ , where  $A = \$12,000$  at 9% compounded daily for 10 years.

$$\text{The principal } P \text{ will be approximately } \$ \quad 4879.38 \quad . (\text{Round to two decimal places as needed.})$$

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

[Click here to watch the video.](#)<sup>5</sup>

The number of bacteria at the beginning of an experiment was 30 and the bacteria grow at an hourly rate of 1.4 percent. Using the model given by  $A(t) = A_0 e^{kt}$ , estimate the number of bacteria, rounded to the nearest whole number, after 20 hours.

$$\text{After 20 hours, the number of bacteria is about } \quad 40 \quad .$$

(Round to the nearest whole number as needed.)

5: <http://mediaplayer.pearsoncmg.com/assets/xOzFUOJNwYiYr3uANKIX7yYvLqEZN0g6?clip=3>

15. Suppose a metal block is cooling so that its temperature  $T$  (in  $^{\circ}\text{C}$ ) is given by  $T = 200 \cdot 4^{-0.3t} + 25$ , where  $t$  is in hours.

- a. Find the temperature after (i) 2 hours, (ii) 2.5 hours.  
 b. How long has the cooling been taking place if the block now has a temperature of  $125^{\circ}\text{C}$ ?  
 c. Find the eventual temperature ( $t \rightarrow \infty$ ).

a. (i) After 2 hours the temperature will be about   $^{\circ}\text{C}$ .

(Simplify your answer. Do not round until the final answer. Then round to the nearest tenth as needed.)

(ii) After 2.5 hours the temperature will be about   $^{\circ}\text{C}$ .

(Simplify your answer. Do not round until the final answer. Then round to the nearest tenth as needed.)

b. The cooling has been taking place about  hours.

(Simplify your answer. Do not round until the final answer. Then round to the nearest integer as needed.)

c. The eventual temperature is   $^{\circ}\text{C}$ .

(Simplify your answer.)

16. The population (in thousands) of people of a city is growing according to the function  $P(t) = 1100(2)^{0.1045t}$ , where  $t$  is the number of years since 1998.

- (a) Find the population of the city in 1998 and in 2005.  
 (b) Predict the population in 2013.  
 (c) When will the population reach 8.8 million?

(a) The population (in thousands) of the city in 1998 is  and in 2005 is .

(Round to the nearest whole number as needed.)

(b) The predicted population (in thousands) in 2013 is .

(Round to the nearest whole number as needed.)

(c) In the year  the population will reach 8.8 million.

(Round to the nearest whole number as needed.)

17. Evaluate the expression.

$$5^0$$

$$5^0 = \text{  }$$

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

18. Evaluate.

$$\left(\frac{2}{5}\right)^{-2}$$

$$\left(\frac{2}{5}\right)^{-2} = \text{  }$$

**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.](#)<sup>1</sup>

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.](#)<sup>2</sup>

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.](#)<sup>3</sup>

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.)

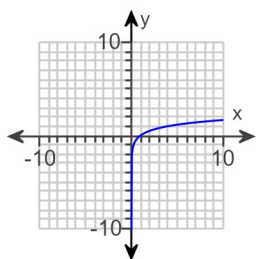
20. Watch the video and then solve the problem given below.

[Click here to watch the video.](#)<sup>4</sup>

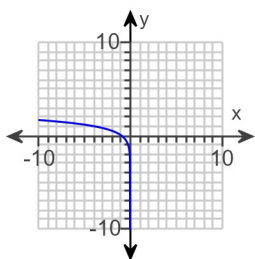
Graph the logarithmic function  $y = \log_4 x$ .

Choose the correct graph below.

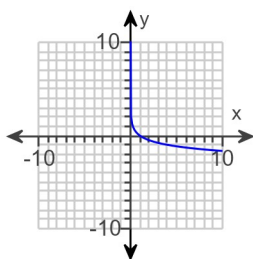
☒ A.



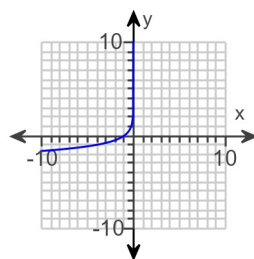
☐ B.



☐ 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.

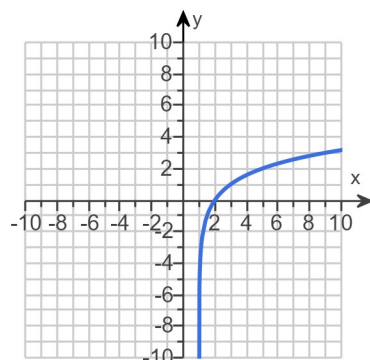
The graph of  $f(x) = \log_2(x - 1)$  could be obtained by translating the graph of  $y = \log_2 x$   unit(s) to the right.

Use the graphing tool to graph the equation.

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

(Type your answer in interval notation.)

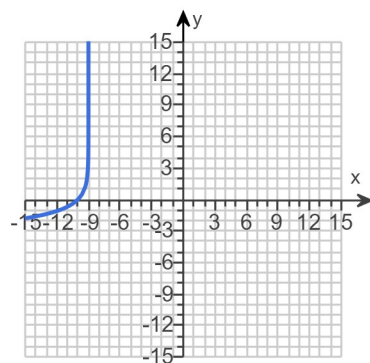
The vertical asymptote is  $x =$  .



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.)



**Student:** Cole Lamers  
**Date:** 06/23/19

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

**Assignment:** 4.3 Rules of Logarithms

1.  $\log_a MN = \underline{\hspace{1cm}} + \underline{\hspace{1cm}}$ .

Choose the correct answer below.

- ☒ **A.**  $\log_a MN = \log_a M + \log_a N$   
☐ **B.**  $\log_a MN = M \log_a N + N \log_a M$   
☐ **C.**  $\log_a MN = M + \log_a N$   
☐ **D.**  $\log_a MN = \log_a M + N$

2.  $\log_a M^r = \underline{\hspace{1cm}}$ .

$\log_a M^r = r \log_a M$

3.  $\log_a(u + v) = \log_a u + \log_a v$ . State whether the statement is true or false.

Choose the correct answer below.

- ☐ True  
☒ False

4. Use  $\log_b 4 = 1.386$  and/or  $\log_b 7 = 1.946$  to find  $\log_b 28$ .

$\log_b 28 = \underline{\hspace{1cm}} 3.332$

5. Given that  $\log x = 3$ ,  $\log y = 7$ , and  $\log 5 \approx 0.7$ , evaluate the following expression without using a calculator.

$\log(5x^2y)$

$\log(5x^2y) \approx \underline{\hspace{1cm}} 13.7$  (Type an integer or a decimal.)

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

[Click here to watch the video.](#)<sup>1</sup>

Write the expression  $\log_7 \frac{x^3(3x+2)^2}{(x-5)^4}$  in expanded form.

$\log_7 \frac{x^3(3x+2)^2}{(x-5)^4} = \underline{\hspace{1cm}} 3 \log_7 x + 2 \log_7(3x+2) - 4 \log_7(x-5)$

1: [http://mediaplayer.pearsoncmg.com/assets/ii54F1eDgFfJUzJdhM4DXkWiVyscF\\_C6?clip=2](http://mediaplayer.pearsoncmg.com/assets/ii54F1eDgFfJUzJdhM4DXkWiVyscF_C6?clip=2)

7. Write the following expression in expanded form.

$$\ln [x(x - 7)]$$

$$\ln [x(x - 7)] = \ln (x) + \ln (x - 7)$$

8. Write the following expression in expanded form.

$$\log \frac{\sqrt{x^2 + 5}}{x + 3}$$

Choose the correct answer below.

☐ A.  $\log \frac{\sqrt{x^2 + 5}}{x + 3} = 2 \log (x^2 + 5) + \log (x + 3)$

☒ B.  $\log \frac{\sqrt{x^2 + 5}}{x + 3} = \frac{1}{2} \log (x^2 + 5) - \log (x + 3)$

☐ C.  $\log \frac{\sqrt{x^2 + 5}}{x + 3} = 2 \log (x^2 + 5) - \log (x + 3)$

☐ D.  $\log \frac{\sqrt{x^2 + 5}}{x + 3} = \frac{1}{2} \log (x^2 + 5) + \log (x + 3)$

9. Express in terms of logarithms without exponents.

$$\log_c (x^2 y^4 z)$$

What is the equivalent expression?

$$2 \log_c (x) + 4 \log_c (y) + \log_c (z)$$

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

[Click here to watch the video.](#)<sup>2</sup>

Write the expression  $2 \ln (5x + 3) - 5 \ln (x - 3) - 4 \ln x$  in condensed form.

$$2 \ln (5x + 3) - 5 \ln (x - 3) - 4 \ln x = \ln \frac{(5x + 3)^2}{x^4 (x - 3)^5}$$

2: [http://mediaplayer.pearsoncmg.com/assets/ii54F1eDgFfJUzJdhM4DXkWIVyscF\\_C6?clip=3](http://mediaplayer.pearsoncmg.com/assets/ii54F1eDgFfJUzJdhM4DXkWIVyscF_C6?clip=3)

11. Write the sum as the logarithm of a single expression. Assume that variables represent positive numbers.

$$\log_2 9 + \log_2 z$$

$$\log_2 9 + \log_2 z = \log_2 (9z)$$

12. Write the given expression in condensed form.

$$\frac{1}{2} \log x - \log (9y) + \log (5z)$$

$$\frac{1}{2} \log x - \log (9y) + \log (5z) = \log \frac{5z\sqrt{x}}{9y}$$

(Type an exact answer. Use integers or fractions for any numbers in the expression.)

13. Write the following expression in condensed form.

$$\ln a + 4 \ln b + 6 \ln c$$

$$\ln a + 4 \ln b + 6 \ln c = \ln (ab^4c^6) \quad (\text{Simplify your answer.})$$

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

[Click here to watch the video.](#)<sup>3</sup>

Use the base changing formula to compute  $\log_3 12$ .

$$\log_3 12 \approx 2.262 \quad (\text{Round to the nearest thousandth as needed.})$$

3: [http://mediaplayer.pearsoncmg.com/assets/ii54F1eDgFfJUZJdhM4DXkWIVyscF\\_C6?clip=5](http://mediaplayer.pearsoncmg.com/assets/ii54F1eDgFfJUZJdhM4DXkWIVyscF_C6?clip=5)

15. Use the change of base formula to find the value of the following logarithm. Do not round logarithms in the change of base formula.

$$\log_4 18$$

$$\log_4 18 = 2.085$$

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

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

$$\log_7 2 + \log_3 4$$

$$\log_7 2 + \log_3 4 = 1.6$$

(Simplify your answer. Type an integer or decimal rounded to one decimal place as needed.)

17. Find the value of the following expression without using a calculator.

$$\log_6 \sqrt{216}$$

$$\log_6 \sqrt{216} = \frac{3}{2} \quad (\text{Simplify your answer. Type an integer or a fraction.})$$

18. Evaluate the expression without using a calculator.

$$\log_4 (\log_2 16)$$

$$\log_4 (\log_2 16) = 1$$

19. Find the value of the following expression without using a calculator.

$$7^{2\log_7 4 + \log_7 3}$$

---

$$7^{2\log_7 4 + \log_7 3} = \text{48} \quad (\text{Simplify your answer.})$$

---

20. Find the value of the expression without using a calculator.

$$\log 40 + 2 \log 5$$

---

Rewrite the expression as a single logarithm.

$$\log 40 + 2 \log 5 = \log \text{1000} \quad (\text{Simplify your answer.})$$

Evaluate the expression without using a calculator.

$$\log 40 + 2 \log 5 = \text{3} \quad (\text{Simplify your answer.})$$

---

21. Suppose that \$2000 is invested in an account that pays interest compounded continuously. Find the amount of time that it would take for the account to grow to \$5000 at 4.75%.

---

It would take approximately 19.3 years.  
(Round to the nearest tenth.)

**Student:** Cole Lamers  
**Date:** 06/23/19

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

**Assignment:** 4.4 Exponential and Log  
 Equations and Inequalities

1. An equation that contains terms of the form  $a^x$  is called a(n) \_\_\_\_\_ equation.

An equation that contains terms of the form  $a^x$  is called a(n) exponential equation.

2. Solve for x.

$$5^x = 625$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☒ **A.** The solution is  $x =$   .  
 (Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)
- ☐ **B.** The solution is not a real number.

3. Solve the equation.

$$9^x = 27$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☒ **A.** The solution is  $\frac{3}{2}$  .  
 (Simplify your answer. Type an integer or a fraction.)
- ☐ **B.** The solution is not a real number.

4. Solve the following equation.

$$125^{|x|} = 625$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☒ **A.** The solution set is  $\left\{ \frac{4}{3}, -\frac{4}{3} \right\}$  .  
 (Use a comma to separate answers as needed. Type an integer or a simplified fraction.)
- ☐ **B.** The solution is the empty set.

5. Solve for x.

$$\ln x = 6$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☒ **A.** The solution set is  $\left\{ e^6 \right\}$  .  
 (Type an exact answer in simplified form. Type exponential notation with positive exponents. Use a comma to separate answers as needed.)
- ☐ **B.** The solution set is the empty set.

6. Solve the logarithmic equation.

$$\log_4 x = -4$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☒ **A.** The solution set is  $\left\{ \frac{1}{256} \right\}$ .  
(Simplify your answer. Type an integer or a fraction.)
- ☐ **B.** The equation has no solution. The solution set is empty,  $\emptyset$ .

7. Solve the equation for y.

$$2^{y+1} = 4$$

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

8. Solve the exponential equation. Write the exact answer with natural logarithms and then approximate the result correct to three decimal places.

$$2^x = 5$$

Select the correct choice below and, if necessary, fill in the answer boxes to complete your choice.

- ☒ **A.** The exact answer(s) with natural logarithms is/are  $x = \frac{\ln 5}{\ln 2}$ .  
(Type an exact answer in simplified form. Type an integer or a fraction. Use a comma to separate answers as needed.)  
The approximate answer(s) is/are  $x \approx$  .  
(Simplify your answer. Type an integer or a decimal. Round to three decimal places as needed. Use a comma to separate answers as needed.)
- ☐ **B.** There is no solution. The solution set is the empty set,  $\emptyset$ .

9. Solve the exponential equation. Write the exact answer with natural logarithms and then approximate the result correct to three decimal places.

$$4^x - 8 \cdot 2^x + 15 = 0$$

Select the correct choice below and, if necessary, fill in the answer boxes to complete your choice.

- ☒ **A.** The exact answer(s) with natural logarithms is/are  $x = \frac{\ln 5}{\ln 2}, \frac{\ln 3}{\ln 2}$ .  
(Type an exact answer in simplified form. Type an integer or a fraction. Use a comma to separate answers as needed.)  
The approximate answer(s) is/are  $x \approx$  .  
(Simplify your answer. Type an integer or a decimal. Round to three decimal places as needed. Use a comma to separate answers as needed.)
- ☐ **B.** The equation has no solution. The solution set is empty,  $\emptyset$ .

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

[Click here to watch the video.](#)<sup>1</sup>

Solve the equation  $5 \log_3 x + 12 = 2$ .

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

1: [http://mediaplayer.pearsoncmg.com/assets/REq\\_kmmsY1PkVdomUKR5IvbUQVJ5fby\\_?clip=6](http://mediaplayer.pearsoncmg.com/assets/REq_kmmsY1PkVdomUKR5IvbUQVJ5fby_?clip=6)

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

[Click here to watch the video.](#)<sup>2</sup>

Solve the equation  $\log_5 x + \log_5 (x + 1) = \log_5 2 + \log_5 (x + 6)$ .

$x =$   (Type an integer or simplified fraction. Use a comma to separate answers as needed.)

2: [http://mediaplayer.pearsoncmg.com/assets/REq\\_kmmsY1PkVdomUKR5IvbUQVJ5fby\\_?clip=7](http://mediaplayer.pearsoncmg.com/assets/REq_kmmsY1PkVdomUKR5IvbUQVJ5fby_?clip=7)

12. Solve the logarithmic equation.

$$\log (x^2 - 3x - 3) = 0$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☒ **A.** The solution set is  $\{$    $, -1$   $\}.$  (Use a comma to separate answers as needed.)
- ☐ **B.** The solution set is the empty set.

13. Solve the following logarithmic equation.

$$\log_3 (x^2 - 7x + 13) = 1$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ **A.** The solution is the empty set.
- ☒ **B.** The solution set is  $\{$    $, 2$   $\}.$   
(Use a comma to separate answers as needed. Type an integer or a simplified fraction.)

14. Solve the logarithmic equation. Give the exact answer.

$$\log_3 (x + 18) - \log_3 (x - 8) = 3$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☒ **A.** The solution set is  $\{$    $\}.$   
(Simplify your answer. Use a comma to separate answers as needed.)
- ☐ **B.** The solution set is the empty set.

15. Solve the following logarithmic equation. Use a calculator where appropriate.

$$\log x + \log (x + 48) = 2$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☒ A. The solution set is  $\{ \text{ } 2 \text{ } \}$ .  
(Simplify your answer. Use a comma to separate answers as needed.)
- ☐ B. The solution set is the empty set.

16. Solve for x.

$$\log_2(x - 5) - \log_2(x + 2) = 3$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The solution set is  $\{ \text{ } \text{ } \}$ .  
(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)
- ☒ B. The solution set is the empty set.

17. Solve the following inequality.

$$\log (4x + 8) < 2$$

The solution set in interval notation is  $\text{ } (-2, 23) \text{ }$ .

(Type an integer or a simplified fraction. Type your answer in interval notation.)

18. Solve the following inequality.

$$\log_3(3x - 6) < 2$$

The solution set is  $\text{ } (2, 5) \text{ }$ .

(Type an integer or a simplified fraction. Type your answer in interval notation.)



Score: 1 of 1 pt

1 of 32

Test Score: 96.88%, 31 of 32 pts

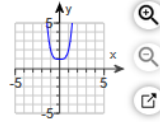
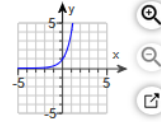
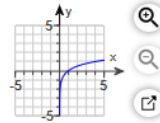
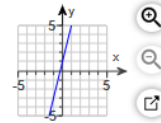
4.1.37



Graph the function on paper, and then choose the correct graph.

$$f(x) = 4^x$$

Choose the correct graph.

☐ A.☒ B.☐ C.☐ D.

## Review Quiz: Practice Quiz 4 (Chapter 4)

Close

Score: 1 of 1 pt

2 of 32

Test Score: 96.88%, 31 of 32 pts

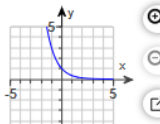
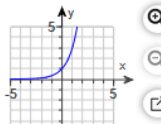
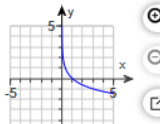
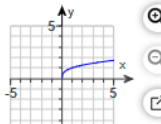
4.1.41



Graph the function.

$$f(x) = \left(\frac{1}{3}\right)^x$$

Choose the correct graph.

☒ A.☐ B.☐ C.☐ D.

Score: 1 of 1 pt

3 of 32 ▼

Test Score: 96.88%, 31 of 32 pts



4.1.61



Write an equation of the graph in the final position.

The graph of  $y = 3^x$  is shifted 4 units to the left and then 8 units up.

Which of the following is the equation of the graph?

- ☐ A.  $y = 3^{x-4} - 8$
- ☐ B.  $y = 3^{x-4} + 8$
- ☐ C.  $y = 3^{x+4} - 8$
- ☒ D.  $y = 3^{x+4} + 8$

## Review Quiz: Practice Quiz 4 (Chapter 4)

Close

Score: 1 of 1 pt

4 of 32 ▼

Test Score: 96.88%, 31 of 32 pts



4.1.65



Using the formula for simple interest and the given values, find  $I$ .

$P = \$951$ ;  $r = 14\%$ ;  $t = 4$  months;  $I = ?$

$I = \$44.38$  (Round to two decimal places.)

## Review Quiz: Practice Quiz 4 (Chapter 4)

[Close](#)

Score: 1 of 1 pt

5 of 32 ▼

Test Score: 96.88%, 31 of 32 pts

✓ 4.1.67



For the values  $P = \$6603$ ,  $r = 4.4\%$ , and  $t = 3$  years and 6 months, find the simple interest.

The simple interest is \$ 1016.86 (Round to two decimal places as needed.)

Score: 1 of 1 pt

6 of 32 ▼

Test Score: 96.88%, 31 of 32 pts

✓ 4.1.119



Evaluate.

$$\left(\frac{4}{5}\right)^{-2}$$

$$\left(\frac{4}{5}\right)^{-2} = \frac{25}{16}$$

Score: 1 of 1 pt

7 of 32 ▼

Test Score: 96.88%, 31 of 32 pts

✓ 4.2.7

[Next Question](#)

Write the equation in its equivalent logarithmic form.

$$8^3 = 512$$

What is the equivalent logarithmic form of the equation?

$$3 = \log_8 512$$

Score: 1 of 1 pt

8 of 32 ▼

Test Score: 96.88%, 31 of 32 pts

✓ 4.2.9



Write in logarithmic form.

$$\left(\frac{1}{5}\right)^{-3} = 125$$

What is the equivalent logarithmic equation?

$$\log_{1/5} 125 = -3$$

(Simplify your answers. Type integers or fractions.)

Score: 1 of 1 pt

9 of 32 ▼

Test Score: 96.88%, 31 of 32 pts

✓ 4.2.13



Convert to a logarithmic equation.

$$5^{-3} = 0.008$$

The equivalent logarithmic equation is

$$\log_5 .008 = -3$$

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

Score: 1 of 1 pt

10 of 32 ▼

Test Score: 96.88%, 31 of 32 pts

✓ 4.2.19

Next Question



Convert to an exponential equation.

$$\log_2 8 = 3$$

Complete the equivalent exponential equation.

$$2^3 = 8$$

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

Score: 1 of 1 pt

11 of 32 ▼

Test Score: 96.88%, 31 of 32 pts

✓ 4.2.27



Write the equation in exponential form.

$$\log_{49} 7 = \frac{1}{2}$$

The equation in exponential form is  $49^{\frac{1}{2}} = 7$ .

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

Score: 1 of 1 pt

12 of 32 ▼

Test Score: 96.88%, 31 of 32 pts

✓ 4.2.31



Evaluate the following.

$$\log_{14} 196$$

$$\log_{14} 196 = 2$$

Score: 1 of 1 pt

13 of 32 ▼

Test Score: 96.88%, 31 of 32 p

✓ 4.2.33



Evaluate the expression without using a calculator.

$$\log 1000$$

$$\log 1000 = 3$$

Score: 1 of 1 pt

14 of 32 ▼

Test Score: 96.88%, 31 of 32 pt

✓ 4.2.35



Find the logarithm.

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

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

Score: 1 of 1 pt

15 of 32 ▼

Test Score: 96.88%, 31 of 32 pts

✓ 4.2.41

Next Question



Evaluate the following expression.

$$\log_8 1$$

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

Score: 1 of 1 pt

16 of 32 ▼

Test Score: 96.88%, 31 of 32 pts

✓ 4.2.47



Simplify.

$${}_3\log_3(7)$$

$${}_3\log_3(7) = 7$$

Score: 1 of 1 pt

17 of 32 ▼

Test Score: 96.88%, 31 of 32 pts

✓ 4.2.53

Next Question



Find the domain of the following function.

$$f(x) = \log_5(x - 6)$$

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

Score: 1 of 1 pt

18 of 32 ▼

Test Score: 96.88%, 31 of 32 pts

✓ 4.2.55

Next Question



Find the domain of the following function.

$$f(x) = \log_2 \sqrt{x+4}$$

The domain is  $(-4, \infty)$ . (Type your answer in interval notation.)

Score: 1 of 1 pt

19 of 32 ▼

Test Score: 96.88%, 31 of 32 pts

✓ 4.2.85



Solve for x.

$$\log x = 4$$

The solution is  $x = 10000$ .

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

Score: 1 of 1 pt

20 of 32

Test Score: 96.88%, 31 of 32 pts

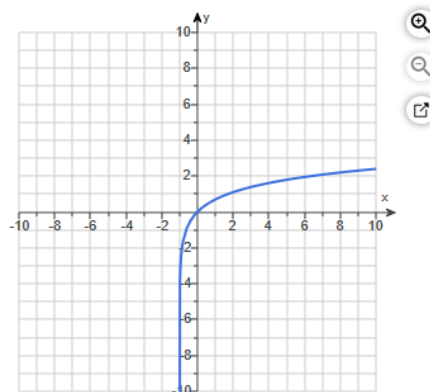
4.2.89



Begin with the graph of  $f(x) = \ln x$  and use transformations to sketch the graph of the given function.

$$g(x) = \ln(x + 1)$$

Use the graphing tool to graph the equation.



Score: 1 of 1 pt

21 of 32

Test Score: 96.88%, 31 of 32 pts

4.3.5



$\log_a(u + v) = \log_a u + \log_a v$ . State whether the statement is true or false.

Choose the correct answer below.

- ☒ False  
☐ True

Score: 1 of 1 pt

22 of 32

Test Score: 96.88%, 31 of 32 pts

4.3.13

Overview, question 22 of 32



Given that  $\log x = 3$ ,  $\log y = 5$ , and  $\log 2 \approx 0.3$ , evaluate the following expression without using a calculator.

$$\log(2x^2y)$$

$\log(2x^2y) \approx 11.3$  (Type an integer or a decimal.)



Score: 1 of 1 pt

23 of 32 ▼

Test Score: 96.88%, 31 of 32 pts

✓ 4.3.19



Write the following expression in expanded form.

$$\ln [x(x+7)]$$

$$\ln [x(x+7)] = \ln (x) + \ln (x+7)$$

Score: 1 of 1 pt

24 of 32 ▼

Test Score: 96.88%, 31 of 32 pts

✓ 4.3.27



Write the following expression in expanded form.

$$\log \frac{\sqrt{x^2+7}}{x+9}$$

Choose the correct answer below.

- ☐ A.  $\log \frac{\sqrt{x^2+7}}{x+9} = 2 \log (x^2+7) + \log (x+9)$
- ☐ B.  $\log \frac{\sqrt{x^2+7}}{x+9} = 2 \log (x^2+7) - \log (x+9)$
- ☒ C.  $\log \frac{\sqrt{x^2+7}}{x+9} = \frac{1}{2} \log (x^2+7) - \log (x+9)$
- ☐ D.  $\log \frac{\sqrt{x^2+7}}{x+9} = \frac{1}{2} \log (x^2+7) + \log (x+9)$

Score: 1 of 1 pt

25 of 32 ▼

Test Score: 96.88%, 31 of 32 pts

✓ 4.3.45



Write the following expression in condensed form.

$$\ln p + 3 \ln q + 6 \ln r$$

$$\ln p + 3 \ln q + 6 \ln r = \ln(pq^3r^6) \text{ (Simplify your answer.)}$$

Score: 1 of 1 pt

26 of 32 ▼

Test Score: 96.88%, 31 of 32 pts

✓ 4.3.57-GC



Use the change of base formula to find the value of the following logarithm. Do not round logarithms in the change of base formula.

$$\log_8 15$$

$$\log_8 15 = 1.3023$$

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

Score: 1 of 1 pt

27 of 32 ▼

Test Score: 96.88%, 31 of 32 pts

✓ 4.4.7



Solve for x.

$$5^x = 125$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☒ A. The solution is  $x = 3$ .  
(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)
- ☐ B. The solution is not a real number.

Score: 1 of 1 pt

28 of 32

Test Score: 96.88%, 31 of 32 pts

✓ 4.4.9

Next Question



Solve the equation.

$$16^x = 32$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

✓ A.

The solution is  $\frac{5}{4}$ .

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

☐ B.

The solution is not a real number.

✗ 4.4.15



Solve for x.

$$\ln x = 6$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☒ A.The solution set is  $\{e^6\}$ .

(Type an exact answer in simplified form. Type exponential notation with positive exponents. Use a comma to separate answers as needed.)

☐ B.

The solution set is the

You answered: 6

Score: 1 of 1 pt

30 of 32

Test Score: 96.88%, 31 of 32 pts

✓ 4.4.17

Next Question



Solve the logarithmic equation.

$$\log_2 x = -2$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

✓ A.

The solution set is  $\left\{\frac{1}{4}\right\}$ .

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

☐ B.The equation has no solution. The solution set is empty,  $\emptyset$ .

Score: 1 of 1 pt

31 of 32 ▼

Test Score: 96.88%, 31 of 32 pts

✓ 4.4.55

Next Question



Solve the logarithmic equation.

$$\log(x^2 + x - 5) = 0$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☒ A. The solution set is  $\{-3, 2\}$ . (Use a comma to separate answers as needed.)
- ☐ B. The solution set is the empty set.

Score: 1 of 1 pt

32 of 32 ▼

Test Score: 96.88%, 31 of 32 pts

✓ 4.4.57



Solve the following logarithmic equation.

$$\log_4(x^2 - 9x + 22) = 1$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The solution is the empty set.
- ☒ B. The solution set is  $\{3, 6\}$ .  
(Use a comma to separate answers as needed. Type an integer or a simplified fraction.)