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 = 4.
  (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 $\{ e^6 \}$.
  (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 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, $\varnothing$.

7. Solve the equation for y.

$2^{y+1} = 4$

$y =$ 1 (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 $x \approx$ 2.322.
(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, $\varnothing$.

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 $x \approx$ 1.585,2.322.
(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, $\varnothing$.

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

Click here to watch the video.[1]

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

$x =$ $\frac{1}{9}$ (Type an integer or simplified fraction.)

1: http://mediaplayer.pearsoncmg.com/assets/REq_kmmsY1PkVdomUKR5lvbUQVJ5fby_?clip=6

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

Click here to watch the video.[2]

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

$x =$ 4 (Type an integer or simplified fraction. Use a comma to separate answers as needed.)

2: http://mediaplayer.pearsoncmg.com/assets/REq_kmmsY1PkVdomUKR5lvbUQVJ5fby_?clip=7

12. Solve the logarithmic equation.

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

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

- **A.** The solution set is $\{ 4, -1 \}$. (Use a comma to separate answers as needed.)
- **B.** The solution set is the empty set.

13. Solve the following logarithmic equation.

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

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 $\{ 5,2 \}$.
  (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 $\{ 9 \}$.
  (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 $\{ 2 \}$.
  (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 $\{ \quad \}$.
  (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 $(-2,23)$.
(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 $(2,5)$.
(Type an integer or a simplified fraction. Type your answer in interval notation.)