

Student: _____
Date: _____

Instructor: Pangyen Weng
Course: MATH 115-51 Summer 2018

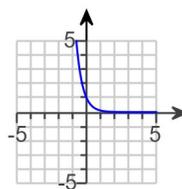
Assignment: HW 6A

1. Graph the equation on paper, then choose the correct graph.

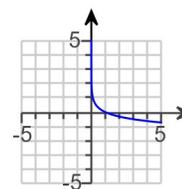
$$y = \log_9 x$$

Choose the correct graph.

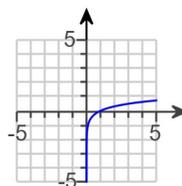
A.



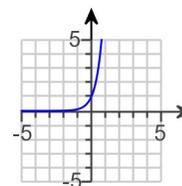
B.



C.



D.



2. Find the logarithm.

$$\log_5 625$$

$$\log_5 625 = \underline{\hspace{2cm}}$$

3. Find the logarithm.

$$\log_8 512$$

$$\log_8 512 = \underline{\hspace{2cm}}$$

4. Evaluate the expression without the use of a calculator.

$$\log 1$$

$$\log 1 = \underline{\hspace{2cm}}$$

(Type an integer or a simplified fraction.)

5. Find the logarithm.

$$\log_3 3^2$$

$$\log_3 3^2 = \underline{\hspace{2cm}}$$

6. Find the logarithm.

$$\log_4 \sqrt[7]{4}$$

$$\log_4 \sqrt[7]{4} = \underline{\hspace{2cm}}$$

(Type a fraction.)

7. Find the logarithm.

$$\log 10^{-4}$$

$$\log 10^{-4} = \underline{\hspace{2cm}}$$

8. Find the logarithm.

$$\log_{20} 1$$

$$\log_{20} 1 = \underline{\hspace{2cm}}$$

9. Convert to a logarithmic equation. $32^{\frac{1}{5}} = 2$	The equation is <input type="text"/> . (Use integers or fractions for any numbers in the equation.)
10. Convert to a logarithmic equation. $e^4 = p$	The equation is <input type="text"/> . (Use integers or fractions for any numbers in the equation.)
11. Convert to a logarithmic equation. $e^{-2} = 0.1353$	The equation is <input type="text"/> . (Use integers or fractions for any numbers in the equation.)
12. Convert to an exponential equation. $\log_4 64 = 3$	The equivalent equation is <input type="text"/> . (Type in exponential form.)
13. Use a calculator to find the common logarithm. $\log 28$ Select the correct choice below and fill in any answer boxes within your choice. <input type="radio"/> A. The answer is _____. (Round to four decimal places.) <input type="radio"/> B. The solution does not exist.	
14. Use a calculator to find the common logarithm. $\log 98$ Select the correct choice below and fill in any answer boxes within your choice. <input type="radio"/> A. The answer is _____. (Round to four decimal places.) <input type="radio"/> B. The solution does not exist.	

15. Use a calculator to find the common logarithm.

$$\log(-75)$$

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

- A. The answer is _____.
(Round to four decimal places as needed.)
- B. The answer does not exist.

16. Find the logarithm using the change of base formula.

$$\log_9 14$$

$$\log_9 14 = \text{[input box]}$$

(Round to four decimal places as needed.)

17. Find the logarithm using the change of base formula.

$$\log_9 0.13$$

$$\log_9 0.13 = \text{[input box]}$$

(Round to four decimal places as needed.)

18. Find the logarithm using the change of base formula.

$$\log_4 18$$

$$\log_4 18 = \text{[input box]}$$

(Round to four decimal places as needed.)

19. Find the logarithm using the change-of-base formula.

$$\log_6 30$$

$$\log_6 30 = \text{[input box]}$$

(Simplify your answer. Type an integer or a decimal. Round to four decimal places as needed.)

20. Solve for x.

$$6^x = 216$$

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.

21. Solve for x.

$$3^x = 14$$

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

- A. The solution is $x =$ _____.
(Type an integer or a decimal. Do not round until the final answer. Then round to four decimal places as needed. Use a comma to separate answers as needed.)
- B. The solution is not a real number.

22. Solve for x.

$$4^{3x-5} = 16$$

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

- A. The solution is $x =$ _____.
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
- B. The solution is not a real number.

23. Solve the following exponential equation.

$$2^x = 5$$

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

- A. The solution is _____.
(Round to four decimal places as needed. Use a comma to separate answers as needed.)
- B. The solution is not a real number.

24. Solve for x.

$$5.3^x = 84$$

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

- A. The solution is $x =$ _____.
(Type an integer or a decimal. Do not round until the final answer. Then round to four decimal places as needed. Use a comma to separate answers as needed.)
- B. The solution is not a real number.

25. Solve for x.

$$\log_2(5x - 6) = 3$$

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

- A. The solution is $x =$ _____.
(Type an exact answer in simplified form. Use a comma to separate answers as needed.)
- B. The solution is not a real number.

26. In 2012, the population of a city was 5.89 million. The exponential growth rate was 1.25% per year.

- Find the exponential growth function.
- Estimate the population of the city in 2018.
- When will the population of the city be 10 million?
- Find the doubling time.

a) The exponential growth function is $P(t) = \text{[]}$, where t is in terms of the number of years since 2012 and $P(t)$ is the population in millions.

(Type exponential notation with positive exponents. Do not simplify. Use integers or decimals for any numbers in the equation.)

b) The population of the city in 2018 is [] million.

(Round to one decimal place as needed.)

c) The population of the city will be 10 million in about [] years after 2012.

(Round to one decimal place as needed.)

d) The doubling time is about [] years.

(Simplify your answer. Round to one decimal place as needed.)

27. Country A has a growth rate of 3.6% per year. The population is currently 4,392,000, and the land area of Country A is 36,000,000,000 square yards. Assuming this growth rate continues and is exponential, after how long will there be one person for every square yard of land?

This will happen in [] years.

(Round to the nearest integer.)

28. Suppose that \$14,425 is invested at an interest rate of 5.8% per year, compounded continuously.

- Find the exponential function that describes the amount in the account after time t , in years.
- What is the balance after 1 year? 2 years? 5 years? 10 years?
- What is the doubling time?

a) The exponential growth function is $P(t) = \text{[]}$.

(Type exponential notation with positive exponents. Do not simplify. Use integers or decimals for any numbers in the equation.)

b) The balance after 1 year is \$ [] .

(Simplify your answers. Round to two decimal places as needed.)

The balance after 2 years is \$ [] .

(Simplify your answers. Round to two decimal places as needed.)

The balance after 5 years is \$ [] .

(Simplify your answers. Round to two decimal places as needed.)

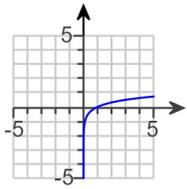
The balance after 10 years is \$ [] .

(Simplify your answers. Round to two decimal places as needed.)

c) The doubling time is [] years.

(Simplify your answers. Round to one decimal place as needed.)

1.



C.

2. 4

3. 3

4. 0

5. 2

6. $\frac{1}{7}$

7. -4

8. 0

9. $\log_{32} 2 = \frac{1}{5}$ 10. $\ln p = 4$ 11. $\ln 0.1353 = -2$ 12. $4^3 = 64$ 13. A. The answer is . (Round to four decimal places.)14. A. The answer is . (Round to four decimal places.)

15. B. The answer does not exist.

16. 1.2011

17. -0.9285

18. 2.0850

19. 1.8982

20. A. The solution is $x =$.

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

21. A. The solution is $x =$.

(Type an integer or a decimal. Do not round until the final answer. Then round to four decimal places as needed. Use a comma to separate answers as needed.)

22. A. The solution is $x =$.

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

23. A. The solution is .

(Round to four decimal places as needed. Use a comma to separate answers as needed.)

24. A. The solution is $x =$.

(Type an integer or a decimal. Do not round until the final answer. Then round to four decimal places as needed. Use a comma to separate answers as needed.)

25. A. The solution is $x =$.

(Type an exact answer in simplified form. Use a comma to separate answers as needed.)

26. $5.89e^{0.0125t}$

6.3

42.3

55.5

27. 250

28. $14,425 e^{0.058t}$

15,286.39

16,199.22

19,277.97

25,763.60

12.0
