## College Prep Algebra Chapter 4 Test

## Indicate the answer choice that best completes the statement or answers the question.

- 1. Use the change-of-base formula to approximate  $log_4\left(\frac{4}{9}\right)$ . Round your answer to four decimal places.
  - A. -0.2027
  - B. -0.5850
  - C. -0.8109
  - D. 0.6309
- 2. Write the equation  $\ln(x) = -8$  in its exponential form.
  - A.  $x = -e^{8}$ B. x = -8eC.  $x = -e^{-8}$ D.  $x = e^{-8}$
- 3. Find the inverse of the function:  $\{(-1, -5), (3, -9), (7, -2), (8, 4), (9, 5)\}$ .
  - A. {(-9,3), (-5, -1), (-2,7), (4,8), (5,9)}
    B. {(-9,-5), (-8,-4), (-7,2), (-3,9), (1,5)}
    C. {(-5,9), (-4,8), (2,7), (5, -1), (9,3)}
    D. no inverse exists

4. The monthly earnings in dollars, of a software sales executive is given by E(x) = 0.05x - 5,000 where x is the value, in dollars, of the software sold by the executive during the month. Find the inverse.

A.  $E^{-1}(x) = 20x - 100,000$ B.  $E^{-1}(x) = 20x + 100,000$ C.  $E^{-1}(x) = -0.05x + 5,000$ D.  $E^{-1}(x) = -20x + 100,000$ 

5. Use algebraic procedures to find the exact solution(s) of the equation  $5^{9x-1} = \frac{1}{25}$ .

A.  $x = \frac{3}{5}$ B.  $x = -\frac{1}{5}$ C.  $x = -\frac{1}{9}$ D.  $x = \frac{1}{3}$ 

- 6. Write the logarithmic equation  $4 = log_5 625$  in its exponential form.
  - A.  $4^{625} = 5$ B.  $4^5 = 625$ C.  $625^4 = 5$ D.  $5^4 = 625$

7. If \$6000 is invested at an annual interest rate of 2.5% and compounded **annually**, find the balance after 5 years, using the formula  $A = P\left(1 + \frac{r}{n}\right)^{nt}$ .

- A. \$7,310.42B. \$6,150.00
- C. \$7,872.52
- D. \$6,788.45
- 8. Evaluate the exponential function  $J(x) = \left(\frac{1}{2}\right)^x$  for x = 4.
  - A. x = 2B. x = 16C.  $x = \frac{1}{16}$ D.  $x = \frac{1}{2}$
- 9. Evaluate the logarithm log 1000 without using a calculator.
  - A. 2
  - B. −2
  - C. 3
  - D. -3

10. The function  $A(t) = 150e^{-0.044t}$  gives the amount of medication, in milligrams, in a patient's bloodstream *t* minutes after the medication has been injected into the patient's bloodstream. Find the amount of medication, to the nearest milligram, in the patient's bloodstream after 75 minutes.

- A. 119 mgB. 6 mgC. 142 mg
- D. 8 mg

11. Use the formula  $A = Pe^{rt}$  to find the balance if \$44,000.00 is invested at an annual rate of 3.5% for 6 years, compounded continuously.

A. \$273,403.60B. \$45,562.63

- C. \$35,665.71
- D. \$54,281.83

12. Evaluate the exponential function  $f(x) = 4^x$  for x = 1.

A. f(1) = 5B. f(1) = 1C. f(1) = 16D. f(1) = 4

13. Expand the logarithmic expression  $ln\left(\frac{z^6}{\sqrt[3]{xy^5}}\right)$ . Assume all variable expressions represent positive real numbers.

A. 
$$ln\left(6z - \frac{1}{5}x - \frac{5}{3}y\right)$$
  
B.  $6ln(z) - 3ln(x) - 15ln(y)$   
C.  $6ln(z) - \frac{1}{3}ln(x) - \frac{5}{3}ln(y)$   
D.  $6ln(z) - \left(\frac{1}{3}ln(x) + \frac{5}{3}ln(y)\right)$ 

14. Using the formula  $A = Pe^{rt}$ . How long will it take \$4500 to triple if it is invested at an annual interest rate of 6.5% compounded continuously? Round to the nearest year.

- A. 31 years
- B. 11 years
- C. 48 years
- D. 17 years

15. Find the domain of the function  $P(x) = \ln(x^2 - 4)$ . Write the domain using interval notation.

A.  $(-\infty, -2)$ B.  $(-2, \infty)$ C.  $(2, \infty)$ D.  $(-\infty, -2) \cup (2, \infty)$  16. Expand the logarithmic expression  $log \frac{100}{xy^3}$ . Assume all variable expressions represent positive real numbers.

A.  $10 - \log x + 3 \log y$ B.  $2 - 3 \log x - \log y$ C.  $10 - \log x - 3 \log y$ D.  $2 - \log x - 3 \log y$ 

17. Expand the logarithmic expression  $ln(x^{\frac{5}{2}}y^{\frac{1}{9}})$ . Assume all variable expressions represent positive real numbers.

A.  $\frac{5}{18}\ln(x)\ln(y)$ B.  $\frac{1}{9}\ln(x) + \frac{5}{2}\ln(y)$ C.  $x\ln\left(\frac{5}{2}\right) + y\ln\left(\frac{1}{9}\right)$ D.  $\frac{5}{2}\ln(x) + \frac{1}{9}\ln(y)$ 

18. Evaluate the logarithm  $log_4 \frac{1}{1024}$  without using a calculator.

- A. -5
- B. 4
- C. 256
- D. -4

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

A.  $log_5 125 = 3$ B.  $log_5 3 = 125$ C.  $log_3 125 = 5$ D.  $log_3 5 = 125$ 

20. Write the exponential equation  $4^3 = 64$  in its logarithmic form.

A.  $log_3 64 = 4$ B.  $log_4 3 = 64$ C.  $log_4 64 = 3$ D.  $log_3 4 = 64$  21. Find the domain of the function  $k(x) = log_3(-6 - x)$ .

- A. (3,∞) B. (6,∞)
- C. (−∞,3)
- D.  $(-\infty, -6)$

22. Use algebraic procedures to find the exact solution of the equation  $6^x = 7776$ .

- A. 6
- **B**. 1
- C. 216
- D. 5

23. Use composition of functions to determine whether  $f(x) = -\frac{1}{8}x - 3$  and g(x) = 8x + 24 are inverses of one another.

- A. Yes
- B. No
- C. Maybe
- D. IDK

24. Solve the exponential equation  $3^x = 3^{x-2}$ 

- A. 2.32
- **B**. -1
- C. 4.57
- D. 3

25. Solve the exponential equation  $5 + e^{x+1} = 20$ 

- A. 1.71
- B. -2.36
- C. 0.71
- D. -1.36

26. Solve the logarithmic equation log(9x + 1) = 3

- A. 1.31B. 1.11C. 1.51
- D. 1.71

27. Find the domain of the function  $s(x) = log_4(x^2 + 8x - 9)$ .

A.  $(-\infty, -9) \cup (1, \infty)$ B.  $(4, \infty)$ C.  $(-\infty, -1) \cup (9, \infty)$ D.  $(-\infty, -4) \cup (4, \infty)$ 

28. Solve the logarithmic equation  $\log x + \log(x + 15) = 2$ 

- A. 10
- B. 5
- C. 20
- D. 50

29. Use composition of functions to determine whether f(x) = 8x = 9 and  $g(x) = \frac{1}{8}x - \frac{9}{8}$  are inverses of one another.

- A. Yes
- B. No
- C. Maybe
- D. IDK

The answer to the following questions is <u>Yes</u>.

30. Is the mascot of APHS a jaguar?

- A. Yes
- B. No

31. Did you enjoy the class?

- A. Yes
- B. No

32. Did you like me as your teacher?

A. Yes

B. No

33. Are you going to do well in college, trade school, or whatever path you choose?

A. YesB. No

34. Did we do any math is this class?

- A. Yes
- B. No

35. Was this class called College Prep Algebra?

- A. Yes
- B. No
- 36. Are you going to miss me, other teachers, and APHS?
  - A. Yes
  - B. No

37. Do I wish you luck in the future?

- A. Yes
- B. No

I enjoyed having <u>each of you</u> in class and wish nothing but the best. Take care and good luck in your future endeavors. T-Whit