

Chapter 10 Logarithms

Academic Algebra 2

Pretest Exponential and Logarithmic Functions

1. Change the following into its exponential form: $\log_4 64 = 3$

A. $4^{64} = 3$

B. $64^4 = 3$

C. $3^4 = 64$

D. $4^3 = 64$

2. Expand $\log \frac{7\sqrt{m}}{p}$

A. $\log 7 + \frac{1}{2} \log m - \log p$

B. $\log 7 + \frac{1}{2} \log m - \log p$

C. $\log 7 - \frac{1}{2} \log m - \log p$

D. $\log 7 + \log m - \log p$

3. Solve for x in the equation $\log_x 81 = 4$

A. 3

B. 4

C. 5

D. 9

4. Which graph represents exponential growth?

A. $y = 5x + 7$

B. $f(x) = 5(1.4)^x$

C. $f(x) = 8x^2$

D. $f(x) = \frac{8}{9x}$

5. Evaluate $\log_2 32$

A. 0

B. 4

C. 6

D. 5

6. Solve the following equation for x : $9^x - 15 = 71$

A. $\frac{\log 96}{\log 9}$

B. $\frac{\log 9}{\log 96}$

C. $\frac{\log 56}{\log 9}$

D. $\frac{\log 9}{\log 56}$

7. Condense $\log 5 - \frac{1}{2} \log b$

A. $\log 5\sqrt{b}$

B. $\log \frac{5}{\sqrt{b}}$

C. $\log 10b$

D. $5 \log b$

8. Solve for x in the equation $6^x = 216$

A. 3

B. 2

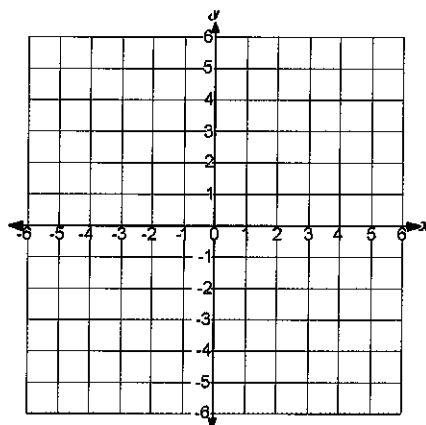
C. 5

D. 36

9. Taylor has \$1700. She deposits the money into a savings account that earns 4% compounded monthly. How much will she have after 7 years? Use

the formula $A = P\left(1 + \frac{r}{n}\right)^{nt}$

10. Draw a model of a graph that represents exponential growth.



11. If $f(x) = 16^x$, what does $f\left(\frac{5}{4}\right)$ equal? _____

12. Solve for x in the following equation. Give your answer to three decimal places. Show your work in the space provided.

$$6^{4x} = 81$$

13. TyJanae wants to have 8,000 dollars in 5 years. She has a CD she wants to invest in that has a rate of 9 percent, compounded monthly. How much should she invest in today to have 8000 dollars in 5 years? Use the formula $A = P\left(1 + \frac{r}{n}\right)^{nt}$.

14. Solve $\log_4(3x + 6) = 2$

Rules

Exponents

$$a^m \cdot a^b = a^{m+b}$$

$$(a^m)^b = a^{mb}$$

$$\frac{a^m}{a^b} = a^{m-b}$$

$$a^{-m} = \frac{1}{a^m}$$

$$\frac{1}{a^{-m}} = a^m$$

$$a^0 = 1$$

$$\sqrt{a} = a^{\frac{1}{2}}$$

$$\sqrt[b]{a^n} = a^{\frac{n}{b}}$$

Common Powers

$$2^3 = 8 \quad 2^4 = 16$$

$$2^5 = 32$$

$$2^6 = 64$$

$$2^8 = 128$$

$$5^3 = 125 \quad 5^4 = 625$$

$$3^3 = 27$$

$$3^4 = 81$$

$$3^5 = 243$$

$$4^3 = 64$$

$$4^4 = 256$$

Logarithms

$$\textcircled{1} \log_x y = w$$
$$x^w = y$$

② CHANGE OF BASE

$$\log_x y = \frac{\log y}{\log x}$$

③ Power

$$\log x^y = y \log x$$

④ Addition

$$\log xy = \log x + \log y$$

⑤ Subtraction

$$\log \frac{x}{y} = \log x - \log y$$

$$\textcircled{6} \log_x x^m = m$$