Name _____ Date _____ Class _____

LESSON 4-3

Practice B

Logarithmic Functions

Write each exponential equation in logarithmic form.

1. $3^7 = 2187$ _____

2. $12^2 = 144$ _____

3. $5^3 = 125$ _____

Write each logarithmic equation in exponential form.

4. $\log_{10} 100{,}000 = 5$ _____

5. $\log_4 1024 = 5$ _____

6. $\log_9 729 = 3$ _____

Evaluate by using mental math.

7. $\log 1{,}000{,}000$ _____

8. $\log 10$ _____

9. $\log 1$ _____

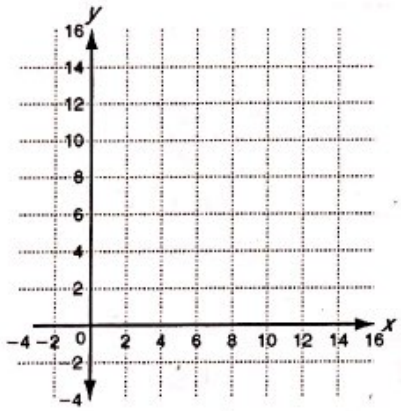
10. $\log_4 16$ _____

11. $\log_8 1$ _____

12. $\log_5 625$ _____

Use the given *x*-values to graph each function. Then graph its inverse. Describe the domain and range of the inverse function.

13. $f(x) = 2^x$; $x = -2, -1, 0, 1, 2, 3, 4$



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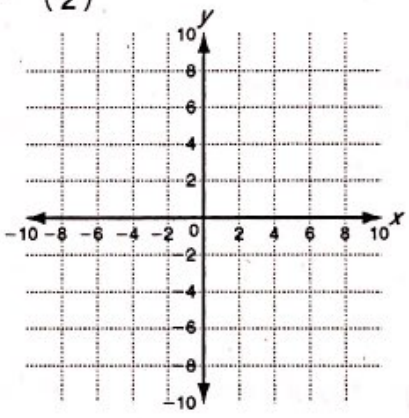
14. $f(x) = \left(\frac{1}{2}\right)^x$; $x = -3, -2, -1, 0, 1, 2, 3$



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Solve.

15. The hydrogen ion concentration in moles per liter for a certain brand of tomato-vegetable juice is 0.000316.

    a. Write a logarithmic equation for the pH of the juice. _____

    b. What is the pH of the juice? _____

LESSON 4-3

Practice C

Logarithmic Functions

Write each exponential equation in logarithmic form.

1. $20^3 = 8000$
2. $11^4 = 14{,}641$
3. $a^b = c$

Write each logarithmic equation in exponential form.

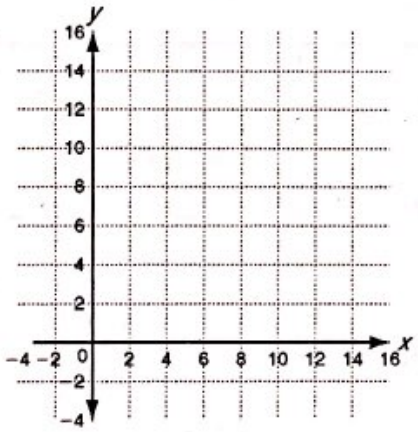
4. $\log_{10} 10{,}000{,}000 = 7$
5. $\log_6 216 = 3$
6. $\log_p q = r$

Evaluate by using mental math.

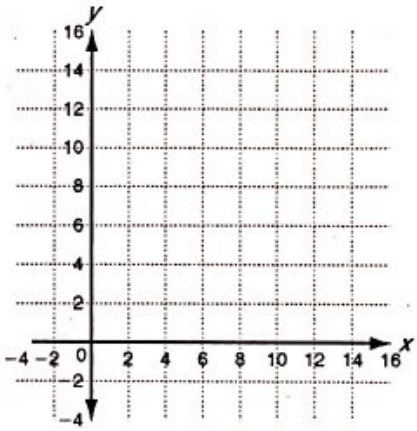
7. $\log 1$
8. $\log 10{,}000$
9. $\log 1{,}000$
10. $\log_5 3125$
11. $\log_{15} 1$
12. $\log_4 256$

Use the given *x*-values to graph each function. Then graph its inverse. Describe the domain and range of the inverse function.

13. $f(x) = 0.1^x$; $x = -1, 0, 1, 2$



14. $f(x) = \left(\frac{5}{2}\right)^x$; $x = -3, -2, -1, 0, 1, 2, 3$

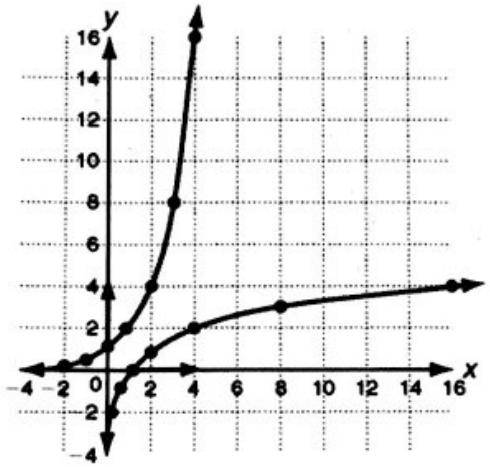


Solve.

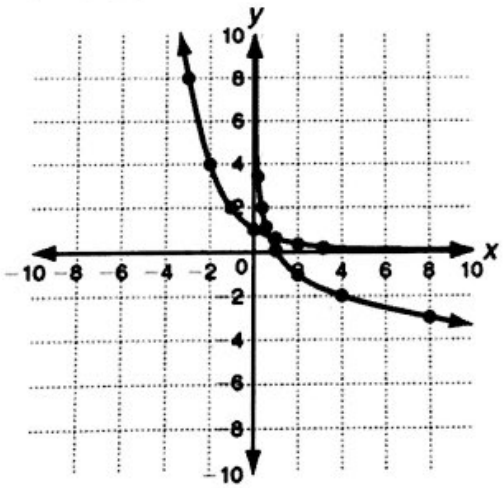
15. The hydrogen ion concentration in moles per liter of a certain solvent is 0.00794.
    a. Write a logarithmic equation for the pH of the solvent.
    b. What is the pH of the solvent?

Practice B

1. $\log_3 2187 = 7$
2. $\log_{12} 144 = 2$
3. $\log_5 125 = 3$
4. $10^5 = 100{,}000$
5. $4^5 = 1024$
6. $9^3 = 729$
7. 6
8. 1
9. 0
10. 2
11. 0
12. 4
13. Domain: $\{x|x > 0\}$; range: all real numbers



14. Domain: $\{x|x > 0\}$;range: all real numbers



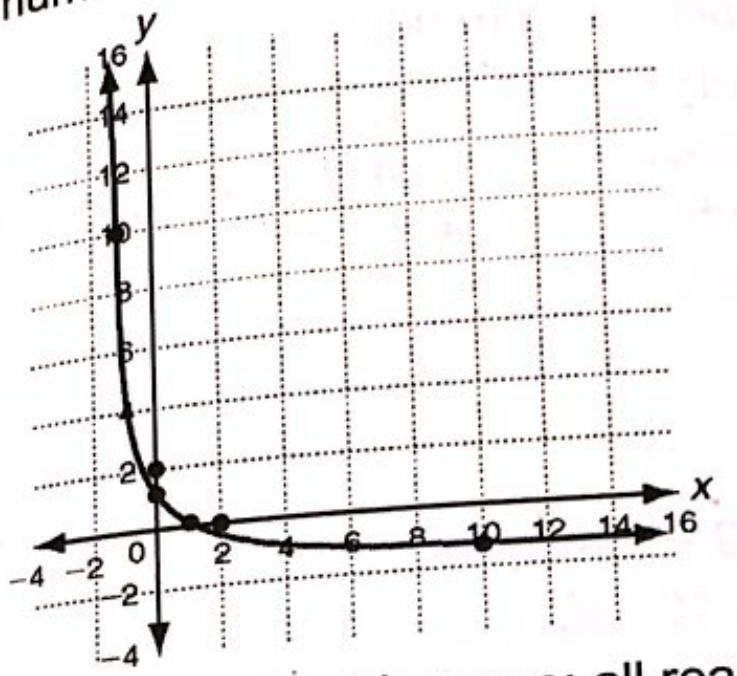
15. a. pH = –log(0.000316)
    b. 3.5

Practice C

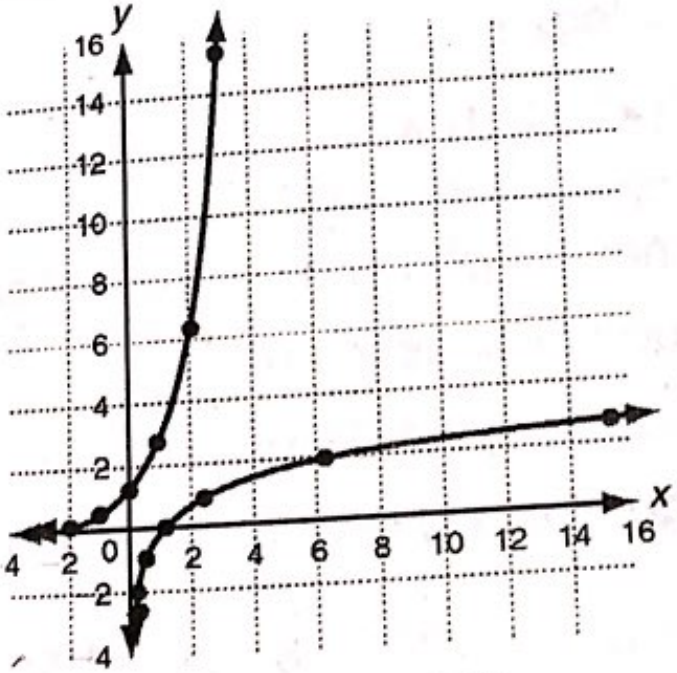
1. $\log_{20} 8000 = 3$
2. $\log_{11} 14{,}641 = 4$
3. $\log_a c = b$
4. $10^7 = 10{,}000{,}000$
5. $6^3 = 216$
6. $p^r = q$
7. 0
8. 4
9. 3
10. 5

11. 0

13. Domain: $\{x|x > 0\}$; range: all real numbers



14. Domain: $\{x|x > 0\}$; range: all real numbers



15. a. $pH = -\log(0.00794)$

b. 2.1