

Name _____

Date _____

6.3 Enrichment and Extension

Logarithms and Logarithmic Functions

Rewriting a logarithmic function in exponential form allows you to find x .

Example: Find the value of x in each equation.

a. $x = \log_4 64$

b. $\frac{1}{2} = \log_9 x$

c. $\frac{1}{3} = \log_x 4$

Solution:

<i>Logarithmic Form</i>	<i>Exponential Form</i>	<i>Answer</i>
a. $x = \log_4 64$	$4^x = 64$	$x = 3$
b. $\frac{1}{2} = \log_9 x$	$9^{1/2} = x$	$x = 3$
c. $\frac{1}{3} = \log_x 4$	$x^{1/3} = 4$	$x = 64$

In Exercises 1–24, find the value of x .

1. $x = \log_2 32$

2. $\log_{10} 1000 = x$

3. $x = \log_6 1296$

4. $\log_8 8 = x$

5. $x = \log_{17} 289$

6. $x = \log_{125} 5$

7. $x = \log_7 1$

8. $x = \log_3 \frac{1}{9}$

9. $x = \log_{10} 0.01$

10. $3 = \log_7 x$

11. $\log_{11} x = 1$

12. $-3 = \log_6 x$

13. $6 = \log_3 x$

14. $\log_{13} x = 0$

15. $\log_8 x = \frac{1}{3}$

16. $-4 = \log_4 x$

17. $\log_8 x = -2$

18. $-1 = \log_3 x$

19. $3 = \log_x 27$

20. $2 = \log_x 16$

21. $\log_x 243 = 5$

22. $\frac{1}{3} = \log_x 8$

23. $\log_x \frac{1}{8} = -3$

24. $\frac{1}{2} = \log_x 49$