

## EXTRA PRACTICE — Exercises

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### Unit X – Exponential and Logarithmic Functions

#### Part D – Solving Open Sentences

#### Lesson 2 – Logarithm Equations

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Solve each of the following logarithmic equations by rewriting them in more familiar exponential form. Be sure to check your answers in the original equation.

1.  $\log_3(5x + 7) = 2$

2.  $\log_5(x + 4) + \log_5(x - 4) = 2$

3.  $\log_3(2x - 6) - \log_3(x + 4) = 2$

4.  $\log x - \log(x + 3) = -1$

5.  $\log_4(2 + x) - \log_4(3 - 5x) = 3$

6.  $\log_4(8x - 6) = 3$

7.  $\log_2(8 - 2x) = 6$

8.  $\log x + \log(x - 9) = 1$

9.  $\log_x(\log_3 27) = 3$

10.  $\log_5 \sqrt{x^2 - 9} = 1$

Solve the following equations containing logarithms by considering them in exponential form. When necessary, round your answer to the nearest tenth.

11.  $\log_4 x = 3$

12.  $\log x = -3$

13.  $\log_5 1 = 3x - 4$

14.  $\log(\log x) = 5$

15.  $\log_5 |x| = 4$

16.  $\log_3 |5x - 7| = 2$

17.  $\log_7 x = 3$

18.  $\log_4 x = \frac{1}{2}$

19.  $\log_x 27 = \frac{3}{2}$

20.  $\log_x 3 = \frac{1}{3}$

## EXTRA PRACTICE — Answers

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Solve each of the following logarithmic equations by rewriting them in more familiar exponential form. Be sure to check your answers in the original equation.

1.  $x = \frac{2}{5}$

2.  $x = \frac{13}{3}$

3. no solution

4.  $x = \frac{1}{3}$

5.  $x = \frac{190}{321}$

6.  $x = \frac{35}{4}$

7.  $x = -28$

8.  $x = 10$  Exponents do not exist that will raise a positive base, 10, to a power that will result in a negative number, -1 or -10.

9.  $x = \sqrt[3]{3}$

10.  $x = \pm\sqrt{34}$

Solve the following equations containing logarithms by considering them in exponential form. When necessary, round your answer to the nearest tenth.

11.  $x = 64$

12.  $x = .001$

13.  $x = \frac{4}{3}$

14.  $x = 10^{100,000}$

15.  $x = \pm 625$

16.  $x = \frac{16}{5}, \frac{-2}{5}$

17.  $x = 343$

18.  $x = 2$

19.  $x = 9$

20.  $x = 27$