6-6 Additional Practice

Exponential and Logarithmic Equations

Find all solutions of the equation. Round answers to the nearest thousandth, if necessary.

1. $\left(\frac{1}{3}\right)^{x-6} = 9^x$
$x = 2$

2. $5^{x+3} = 5^{2x-1}$
$x = 4$

3. $0.0001 = 10^{2x}$
$x = -2$

4. $14^{x+7} = 196^{x+2}$
$x = 3$

5. $36x^2 = 216^{x+3}$
$x = 3$

6. $2^{3x-2} = 4x^2$
$x = 2$

7. $15 = 4x$
$x \approx 1.953$

8. $4 + 3^{x-5} = 15$
$x \approx 7.183$

9. $e^{x+1} = 5$
$x \approx 0.609$

10. $4^{x-3} - 3 = 6$
$x \approx 4.585$

11. $3^{x-2} = 4$
$x \approx 3.262$

12. $5^{x+3} = 4$
$x \approx -2.139$

13. The price of an item was $50.00 in 2010. Suppose that from 2010 to 2016 the price of the item increased by 6% every year. What is the price of the item in 2016? Round answer to the nearest hundredth. **$70.93**

Find all solutions of the equation. Round answers to the nearest hundredth, if necessary.

14. $\log_3 (2^x) = \log_3 18$
$x = 9$

15. $\log_5 (x^2 - 2x) = \log_5 (x - 2)$
$x = 2$

16. $\log_2 (2x) = \log_2 (x + 3)$
$x = 3$

17. $\ln(x^2 - 4x) = \ln(-4x + 25)$
$x = 5$ or -5

18. $\ln(2x + 3) = \ln(-2x + 7)$
$x = 1$

19. $\log_4 (x + 1) = \log_4 (3x - 5)$
$x = 3$

Solve the equations below by graphing. Use a graphing calculator to help you. Round answers to the nearest thousandth.

20. $\log (3x - 4)^2 = x + \log x$
(1.353, 1.485)

21. $\ln(5x) = x^2$
(0.209, 0.044) and (1.393, 1.941)