Name_____ Date _____

6.4 Practice A

In Exercises 1–9, solve the equation. Check your solution.

1. $3^{4x} = 3^{12}$

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

3. $5^{3x} = 5^{2x-7}$

4. $3^x = 27$

5. $5^x = 625$

6. $11^{x-4} = 121^x$

7. $\left(\frac{1}{3}\right)^x = 81$

8. $\frac{1}{125} = 5^{2x+7}$

9. $7^{5-4x} = \frac{1}{343}$

10. Describe and correct the error in solving the exponential equation.

$$\left(\frac{1}{6}\right)^{3x-1} = 36^{x-7}$$
$$\left(6^{-1}\right)^{3x-1} = \left(6^{-2}\right)^{x-7}$$
$$-3x + 1 = -2x + 14$$
$$x = -13$$

In Exercises 11–16, use a graphing calculator to solve the equation.

11. $5^{x-1} = 10$

12. $3^{x+5} = 7$

13. $\left(\frac{1}{3}\right)^{6x+1} = -5$

14. $\left(\frac{1}{4}\right)^{x+2} = 9$

15. $3^{x-5} = 3x - 4$

16. $4x + 1 = 5^{x-3}$

In Exercises 17–19, solve the equation using the Property of Equality for Exponential Equations.

17. $40 \bullet 5^{x-2} = 200$

18. $8 \bullet 2^{x+6} = 32$

19. $3\left(4^{-3x-1}\right) = 48$

20. A bacterial culture triples in size every hour. You begin observing the number of bacteria 2 hours after the culture is prepared. The amount y of bacteria x hours after the culture is prepared is represented by $y = 162\left(3^{x-2}\right)$. When will there be 8100 bacteria?

In Exercises 21–23, solve the equation.

21. $2^{3x-6} = 8^{x-2}$

22. $9^{3x-2} = 27^{2x-2}$

23. $2^{4(x-3)} = 16^{x+1}$

In Exercises 24 and 25, use a graphing calculator to solve the equation.

24. $7^{x+3} = \sqrt{7}$

25. $\sqrt{10} = 10^{3x-1}$