Name_____ Date _____

5.5   Practice A

In Exercises 1–6, solve the equation.

1. $6^{x-7} = 6^{2x+3}$

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

3. $3^{x+1} = 9^{x-3}$

4. $2^x = 5$

5. $8^x = 35$

6. $16^{3x-2} = \left(\dfrac{1}{4}\right)^{5-x}$

7. The length ℓ (in centimeters) of a scalloped hammerhead shark can be modeled by the function $\ell = 266 - 219e^{-0.05t}$, where t is the age (in years) of the shark.

   a. How old is a shark that is 200 centimeters long?

   b. How long is a shark that is twice as old as the shark in part (a)?

In Exercises 8–13, solve the equation.

8. $\ln(3x - 8) = \ln(x + 6)$

9. $\log_3(9x - 2) = \log_3(4x + 3)$

10. $\log(4x + 1) = \log 25$

11. $\log_6(5x + 4) = 2$

12. $\log(10x - 7) = 3$

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

In Exercises 14–17, solve the equation. Check for extraneous solutions.

14. $\log_2 x + \log_2(x - 3) = 2$

15. $\log_3 3x + \log_3(2x + 1) = 2$

16. $\ln x + \ln(x + 4) = 3$

17. $\log_6 2x^2 + \log_6 3 = 2$

18. You deposit $400 in an account that pays 5% annual interest. How long will it take for the balance to double for each frequency of compounding?

   a. annually

   b. quarterly

   c. daily

   d. continuously

In Exercises 19–21, solve the inequality.

19. $7^x < 42$

20. $3^x \geq 24$

21. $\log_3 x > 2$

In Exercises 22 and 23, use a graphing calculator to solve the equation.

22. $\ln 3x = 4^{-x+5}$

23. $\log x = 9^{-2x}$