Name _____ Date _____

5.5 Practice B

In Exercises 1–6, solve the equation.

1. $9^{3x-5} = 81^{3x+2}$

2. $7^{x} = 32$

3. $9^{3x+6} = \left(\frac{1}{3}\right)^{8-x}$

4. $6^{4x} = 13$

5. $2e^{3x} + 6 = 10$

6. $4e^{2x} - 7 = 1$

7. Fifty grams of radium are stored in a container. The amount R (in grams) of radium present after t years can be modeled by $R = 50e^{-0.00043t}$.

a. After how many years will only 20 grams of radium be present?

b. Seventy-five grams of radium are stored in a different container. The amount R (in grams) of radium present after t years can be modeled by $R = 75e^{-0.00043t}$. Will it take *more years* or *fewer years* for only 20 grams of the radium in this container to be present, compared to the answer in part (a)? Explain.

In Exercises 8–13, solve the equation.

8. $\ln(5x - 2) = \ln(x + 6)$

9. $\log(3x + 5) = \log 6$

10. $\log_2(3x + 12) = 4$

11. $\log_3(3x + 7) = \log_3(10x)$

12. $\log_2(x^2 - 2x + 1) = 4$

13. $\log_3(x^2 + x + 7) = 3$

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

14. $\ln x + \ln(x - 2) = 5$

15. $\log_5 2x^2 + \log_5 8 = 2$

16. $\log_3(-x) + \log_3(x + 8) = 2$

17. $\log_2(x + 2) + \log_2(x + 5) = 4$

In Exercises 18–20, solve the inequality.

18. $e^{x-2} < 8$

19. $\ln x > 5$

20. $-2 \log_3 x + 2 \leq 10$

21. You deposit \$2000 in Account A, which pays 2.25% annual interest compounded monthly. You deposit another \$2000 in Account B, which pays 3% annual interest compounded monthly. When is the sum of the balance in both accounts at least \$5000?