Name _____ Date _____

5.1 Practice B

In Exercises 1–6, simplify the expression.

1. $e^{-9} \cdot e^{7}$

2. $\dfrac{27e^4}{18e^7}$

3. $\left(5e^{-4x}\right)^3$

4. $\sqrt{20e^{8x}}$

5. $\sqrt[3]{64e^{9x}}$

6. $e^{2x} \cdot e^{5} \cdot e^{x-2}$

7. Describe and correct the error in simplifying the expression.

$$\times \quad \left(2e^{-3x}\right)^4 = \frac{1}{16e^{12x}}$$

In Exercises 8–10, tell whether the function represents *exponential growth* or *exponential decay*. Then graph the function.

8. $y = 2e^{3x}$

9. $y = 0.5e^{-2x}$

10. $y = 0.4e^{0.5x}$

In Exercises 11–13, use the properties of exponents to rewrite the function in the form $y = a(1 + r)^t$ or $y = a(1 - r)^t$. Then find the percent rate of change.

11. $y = e^{0.25x}$

12. $y = 3e^{-0.65x}$

13. $y = 0.25e^{0.9x}$

In Exercises 14–16, use a table of values or a graphing calculator to graph the function. Then identify the domain and range.

14. $y = e^{x-4}$

15. $y = 4e^x - 1$

16. $y = 2e^x + 5$

17. You invest $5000 in an account to save for college.

  a. Option 1 pays 4% annual interest compounded monthly. What would be the balance in the account after 2 years?

  b. Option 2 pays 4% annual interest compounded continuously. What would be the balance in the account after 2 years?

  c. What is the difference between the two options after 10 years?

  d. How would your answer to part (c) change if you invested $50,000?