Name _____ Date _____

Continuously Compounded Interest

When interest is compounded *continuously*, the amount A in an account after t years is given by the formula

$$A = Pe^{rt}$$

where P is the principal and r is the annual interest rate expressed as a decimal.

Notes:

Extra Practice

In Exercises 1–4, simplify the expression.

1. $e^{-9} \cdot e^{12}$

2. $\dfrac{25e^2}{35e^7}$

3. $\left(2e^{-3x}\right)^5 \cdot 2e^{x+1}$
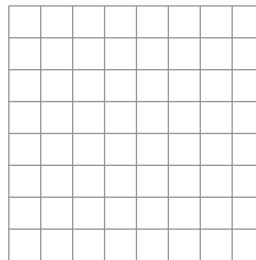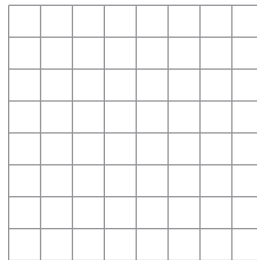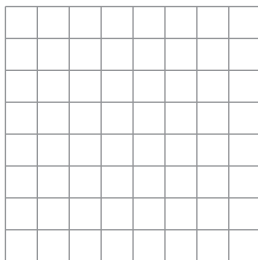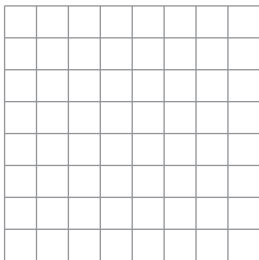
4. $\sqrt[4]{16e^{24x}}$

In Exercises 5–8, tell whether the function represents *exponential growth* or *exponential decay.* Then graph the function.

5. $y = 2e^{-x}$

6. $y = 0.75e^{4x}$

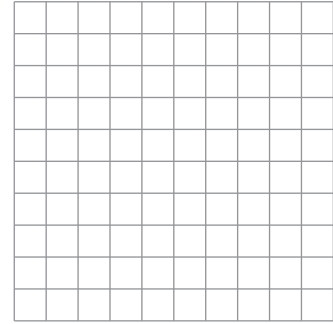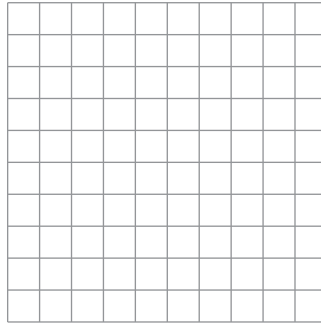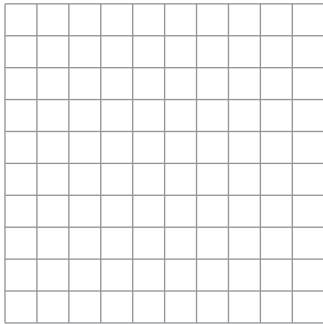**7.** $y = 5e^{0.25x}$

8. $y = 0.8e^{-3x}$

6.2 **Notetaking with Vocabulary** (continued)

In Exercises 9–11, use a table of values or a graphing calculator to graph the function. Then identify the domain and range.

9. $y = e^x - 4$ 　　　　　　**10.** $y = 2e^{x+3}$ 　　　　　　**11.** $y = -e^x + 5$

12. The population of Evans City is currently 48,500 and is declining at a rate of 2.5% each year. You can model the population of Evans City by the equation $P_t = P_c e^{rt}$, where P_c is the current population, P_t is the population after t years, and r is the decimal rate of decline per year. Predict the population of Evans City after 25 years.

13. Your parents will need $25,000 in 10 years to pay for your brother's college tuition. They can invest in an account with an interest rate of 9.8% that compounds continuously. How much should your parents invest today in order to have your brother's full tuition available in 10 years?