EXAMPLE 5 **Model continuously compounded interest**

FINANCE You deposit $4000 in an account that pays 6% annual interest compounded continuously. What is the balance after 1 year?

Solution

Use the formula for continuously compounded interest.

$A = Pe^{rt}$ **Write formula.**

$= 4000e^{0.06(1)}$ **Substitute 4000 for P, 0.06 for r, and 1 for t.**

≈ 4247.35 **Use a calculator.**

▶ The balance at the end of 1 year is $4247.35.

✔ **GUIDED PRACTICE** **for Example 5**

10. **FINANCE** You deposit $2500 in an account that pays 5% annual interest compounded continuously. Find the balance after each amount of time.

 a. 2 years **b.** 5 years **c.** 7.5 years

11. **FINANCE** Find the amount of interest earned in parts (a)–(c) of Exercise 10.

7.3 EXERCISES

SKILL PRACTICE

1. **VOCABULARY** Copy and complete: The number __?__ is an irrational number approximately equal to 2.71828.

2. **WRITING** Tell whether the function $f(x) = \frac{1}{3}e^{4x}$ is an example of *exponential growth* or *exponential decay*. *Explain*.

EXAMPLE 1
on p. 492
for Exs. 3–18

SIMPLIFYING EXPRESSIONS **Simplify the expression.**

3. $e^3 \cdot e^4$ 4. $e^{-2} \cdot e^6$ 5. $(2e^{3x})^3$ 6. $(2e^{-2})^{-4}$

7. $(3e^{5x})^{-1}$ 8. $e^x \cdot e^{-3x} \cdot e^4$ 9. $\sqrt{9e^6}$ 10. $e^x \cdot 5e^{x+3}$

11. $\frac{3e}{e^x}$ 12. $\frac{4e^x}{e^{4x}}$ 13. $\sqrt[3]{8e^{9x}}$ 14. $\frac{6e^{4x}}{8e}$

15. **MULTIPLE CHOICE** What is the simplified form of $(4e^{2x})^3$?

 Ⓐ $4e^{6x}$ Ⓑ $4e^{8x}$ Ⓒ $64e^{6x}$ Ⓓ $64e^{8x}$

16. **MULTIPLE CHOICE** What is the simplified form of $\sqrt{\frac{4(27e^{13}x)}{3e^7x^{-3}}}$?

 Ⓐ $6e^{10}x$ Ⓑ $6e^6x^4$ Ⓒ $\frac{6e^3}{x^2}$ Ⓓ $6e^3x^2$