COMPOUND INTEREST **Compound interest** is interest earned on both an initial investment and on previously earned interest. Compounding of interest can be modeled by exponential growth where a is the initial investment, r is the annual interest rate, and t is the number of years the money is invested.

EXAMPLE 5 TAKS PRACTICE: Multiple Choice

You put $350 in a savings account that earns 3% annual interest compounded yearly. You do not make any deposits or withdrawals. How much will your investment be worth in 5 years?

Ⓐ $392 Ⓑ $393.93 Ⓒ $770 Ⓓ $999.64

ESTIMATE

You can use the simple interest formula, $I = prt$, to estimate the amount of interest the account earns: $(350)(0.03)(4) = 42$. Compounding interest will result in slightly more than $42.

Solution

$y = a(1 + r)^t$ Write exponential growth model.

$= 350(1 + 0.03)^4$ Substitute 350 for a, 0.03 for r, and 4 for t.

$= 350(1.03)^4$ Simplify.

≈ 393.93 Use a calculator.

You will have $393.93 in 4 years.

▶ The correct answer is B. Ⓐ Ⓑ Ⓒ Ⓓ

GUIDED PRACTICE for Examples 4 and 5

5. **WHAT IF?** In Example 4, suppose the owner of the car sold it in 1994. Find the value of the car to the nearest dollar.

6. **WHAT IF?** In Example 5, suppose the annual interest rate is 3.5%. How much will your investment be worth in 5 years?

8.5 EXERCISES

HOMEWORK KEY

- = **WORKED-OUT SOLUTIONS** on p. WS1 for Exs. 13 and 41
- = **TAKS PRACTICE AND REASONING** Exs. 34, 42, 43, 46, and 52
- = **MULTIPLE REPRESENTATIONS** Ex. 41

SKILL PRACTICE

1. **VOCABULARY** In the exponential growth model $y = a(1 + r)^t$, the quantity $1 + r$ is called the ___?___.

2. **VOCABULARY** For what values of b does the exponential function $y = ab^x$ (where $a > 0$) represent exponential growth?

3. **WRITING** How does the graph of $y = 2 \cdot 5^x$ compare with the graph of $y = 5^x$? *Explain.*