6.4 Savings & Retirement Plans

▶ Find the balance in a savings account.

▶ Find the balance in an increasing annuity.

▶ Analyze a decreasing annuity.

Finding the Balance in a Savings Account

When you deposit money into a savings account earning compound interest, the balance in the account grows exponentially. The formula for the balance depends on how often the interest is compounded.

Interest Compounded Monthly

The balance A in a savings account with a principal of P, for n months at an annual percentage rate of r (in decimal form), compounded monthly, is

$$A = P\left(1 + \frac{r}{12}\right)^n.$$

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You can access compound interest calculators at *Math.andYou.com*.

EXAMPLE 1   **Comparing Terms for a Savings Plan**

When your daughter is born, your grandparents deposit $5000 into a savings account that earns 4%, compounded monthly.

a. Find the balance in the account when your daughter is 18 years old.

b. Find the balance in the account when your daughter is 26 years old.

SOLUTION

12(18)

a. $A = 5000\left(1 + \frac{0.04}{12}\right)^{216} = \$10{,}259.87$ 18th birthday

12(26)

b. $A = 5000\left(1 + \frac{0.04}{12}\right)^{312} = \$14{,}121.64$ 26th birthday

✓ **Checkpoint**   Help at *Math.andYOU.com*

Suppose your grandparents invest the money into a mutual fund that earns 10%, compounded monthly.

c. Find the balance in the account when your daughter is 18 years old.

d. Find the balance in the account when your daughter is 26 years old.

Study Tip

The *Rule of 72* is commonly used by investors. It states that the number of years it will take for an investment to double is equal to 72 divided by the interest rate.