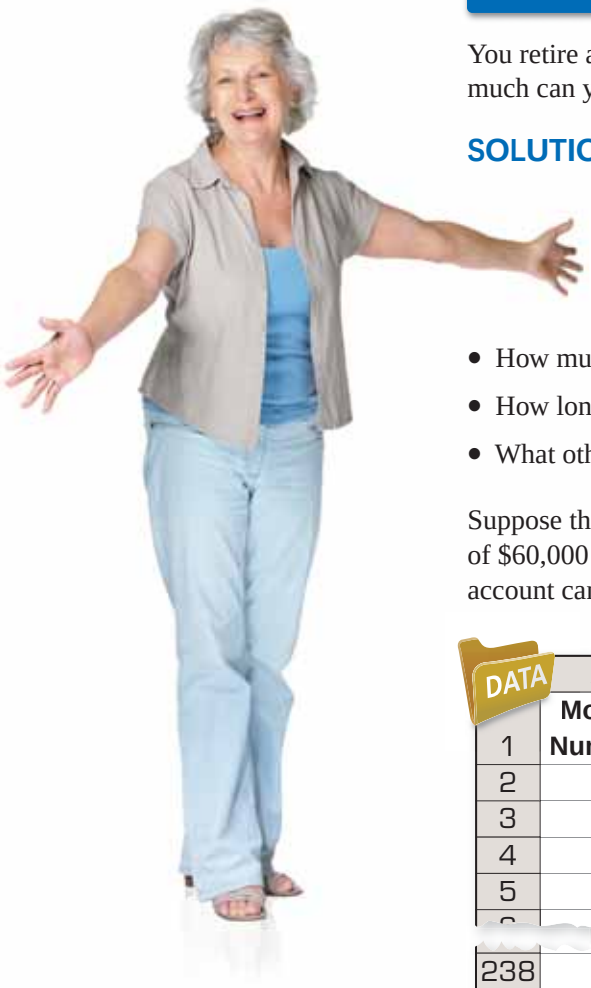
Analyzing a Decreasing Annuity

A **decreasing annuity** is an investment that is earning interest, and from which you make regular withdrawals of a fixed amount.

EXAMPLE 5 Withdrawing from a Retirement Plan



You retire at age 68. Your 401(k) retirement plan has a balance of $1 million. How much can you withdraw from your account each year?

SOLUTION

One option is to withdraw all of it. Of course, the deposits were tax deferred, so when you withdraw the funds, you will have to pay income tax on the withdrawals. To decide how much you should withdraw for a retirement income, you should consider the following.

- How much interest is the account earning?
- How long do you expect to live?
- What other income sources do you have?

Suppose the account earns 5%, compounded monthly, and you want an income of $60,000 a year. You can use a spreadsheet to determine how many years the account can continue making payments.

DATA

	A	B	C	D	E
1	Month Number	Balance before Withdrawal	Monthly Withdrawal	Interest Earned	Balance after Withdrawal
2	1	$1,000,000.00	$5,000.00	$4,145.83	$999,145.83
3	2	$999,145.83	$5,000.00	$4,142.27	$998,288.11
4	3	$998,288.11	$5,000.00	$4,138.70	$997,426.81
5	4	$997,426.81	$5,000.00	$4,135.11	$996,561.92
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238	237	$658,081.18	$5,000.00	$2,721.17	$655,802.36
239	238	$655,802.36	$5,000.00	$2,711.68	$653,514.03
240	239	$653,514.03	$5,000.00	$2,702.14	$651,216.17
241	240	$651,216.17	$5,000.00	$2,692.57	$648,908.74
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After 20 years, you are 88 years old. Your account still has a balance of nearly $650,000, and you have withdrawn a total of $1.2 million from the account.

Checkpoint

Help at Math.andYOU.com

Rework Example 5 using the following conditions.

a. Withdrawals: $70,000 a year Earned interest: 5%

b. Withdrawals: $60,000 a year Earned interest: 4%

c. Withdrawals: $100,000 a year Earned interest: 6%

What would you do? Explain your reasoning.