grows at 4.0% annually. Using a spreadsheet, calculate the end-of-year balance for the portfolio with the assumption that no more funds will be deposited into any of these accounts. How long until they reach the $2,000,000 goal?

2. ***Changing future value growth rates.*** Sunshine Growers produces Christmas trees and is trying to determine the optimal harvest time for the trees. Trees sell for $5 per foot. The trees grow at the following rate after planted as seedlings that are one foot tall: first three years, 60% growth rate; second three years, 40% growth rate; all future years, 20% growth rate. The cost to maintain a tree increases each year. The first year, the maintenance cost is $3.00 per tree. The maintenance costs grow at a rate of 30% per year. When is the optimal time to harvest the trees? Use a spreadsheet and calculate the revenue each year if Sunshine Growers harvests the trees that year and subtract the accumulated costs of maintenance to find the gross profit for the year. At what height (year) do the trees produce the highest gross profit?

MINI-CASE

Richards' Tree Farm, Inc.: The Continuing Saga

This mini-case is available in MyFinanceLab.

Richards' Tree Farm, Inc. is doing well after its incorporation. Jake Richards, president, chief of operations, and majority shareholder, currently has a planting of 10,000 three-year-old Japanese dogwood trees in a recently introduced pink-flowered variety. Richards can sell this type of tree at a higher price than the more common white-flowered variety. The trees are now 6 feet tall on average and can command $24 each. At present, Richards has priced 8-foot trees at $34 and 10-foot trees at $40. Landscape contractors avoid trees larger than 10 feet tall because they are difficult to transplant successfully. With average weather, the 6-foot trees will be 8 feet tall in another three years and 10 feet tall in six more years.

Jake has to make financial decisions almost every day. Today's decision involves present value and future value computations, which Jake learned as a student at Oregon State University. He wants to know if he should sell the trees immediately at 6 feet tall, three years from now at 8 feet tall, or six years from now at 10 feet tall.

Size	Age	Current Market Value
6′	3 years	$24.00
8′	6 years	$34.00
10′	9 years	$40.00

Questions

1. Because of inflation, Jake expects the price at which he can sell the trees to increase by 3% per year. What price does he expect to receive if he keeps the trees until they reach 8 feet or 10 feet tall?
2. If Jake discounts the future price of the trees at 10% per year, what is the present value of their future prices?
3. Using the time value of money equation, compute the growth rate of the trees between the third year and the sixth year and between the sixth year and the ninth year.
4. When should Jake sell the trees?
5. **Challenge question.** A major landscape contractor who has bid successfully on a large-scale Boston beautification and urban greening project has offered to buy all 10,000 flowering dogwood trees at a price of $28,000, payable immediately. However, the contractor does not need the trees for three years. If Jake accepts, he will be obliged to deliver 10,000 trees three years from today. If anything should happen to his own crop, he would need to buy trees on the open market at the prevailing price, which might be higher or lower than the price estimated in Question 1. Should Jake accept the offer if his required rate of return is 10%? *Hint:* What is the present value of the price he expects to receive for the trees three years in the future? Discount the price at 10%.