MATH 1030: Homework 6

due February 28, 2014

Instructions: Do the following problems on a separate sheet of paper. Show all of your work.

Fereidoun M. Esfandiary, a futurist and transhumanist, was born in Iran in 1930. He lived in 17 countries by the time he was 11. In 1970, he changed his name to FM-2030 because "conventional names define a person's past: ancestry, ethnicity, nationality, religion. [...] The name 2030 reflects my conviction that the years around 2030 will be a magical time."

Problem 1

With the sales from FM-2030's first nonfiction book *Upwingers: A Futurist Manifesto* in 1973, he decided to open a savings account. Being a transhumanist, FM wanted to get the most for his money. His bank offered an account with an APR of 7.43% compunded annually or an account with an APR of 7.37% compounded quarterly.

(a) Compute the APY for both of the accounts to determine which account is the better investment.

(b) If FM-2030 deposited $\$15,000$ into the better account, how much did he have in the account 27 years later in the year 2000?

(c) Of the total amount in the year 2000, what percentage was deposited and what pecentage was earned in interest?

Problem 2

As a futurist, FM-2030 decided that cryopreservation was for him. The Alcor Life Extension Foundation in Scottsdale, Arizona charges $\$150,000$ to cryogenically freeze an entire body.

(a) If he wanted to have the $\$150,000$ by the year 1995 and his savings account compounded continuously at an apr of 5.8%, how much did he need to deposit in 1975 in order to reach his goal?

(b) If he wanted to have the $\$150,000$ by the year 2000 and his savings account compounded monthly at an APR of 4.8%, how much did he need to deposit in 1975 in order to reach his goal?

Problem 3

In addition to the $\$150,000$ freezing fee, there is also a yearly membership fee of \$500. FM-2030 knew that he might be in cryopreservation for hundreds of years, so he needed a savings account that earns \$500 in interest every year.

(a) If his bank account has an APR of 5.5%, how much money does he need in the account in order to generate the \$500 in interest every year.

(b) Suppose that his account with the APR of 5.5% compounds daily. If he decided to start the account in 1980, how much should he have deposited in order to have the amount calculated in part (a) by the year 2000?

Problem 4

Unfortunately, FM-2030 did not make it to year 2030 alive. He died of pancreatic cancer on July 8, 2000. However, he was cryogenically frozen as planned. Suppose he took his remaining $\$100,000$ and deposited it in a bank account that compounds every 2 months at an APR of 6%.

(a) If FM-2030 is unfrozen in the year 2415, how much will he have in his bank account?

(b) What percent more than the deposited $\$100,000$ is the account total in the year 2415?

Book Exercises

§4B Exercises 46, 48, 52, 56, 74, 82, 89, 90