Unit 1: The Mathematics of Savings and Investments

Goal: To understand savings and investment instruments and to use mathematics to determine the effect of money, interest rate, and time on the total amount in a savings or investment account.

Expectations

1. analyze various investment instruments as to their purposes, advantages, and disadvantages, such as savings and checking accounts, certificates of deposit, stocks, social security, individual retirement accounts, and bonds.

   Example:

   Which investment instrument would be most appropriate for the following situations: buying a new car in 3 years, saving money for a child's college education, and retirement savings.

   Example:

   Compare the characteristics of a checking account and a savings account. What are the advantages and disadvantages of each?

   Example:

   A bank offers a savings rate of 4% compounded monthly. What is the effective rate?

2. apply appropriate models and representations for various types of investments to determine the best investment plan for a given situation.

   Example:

   You have the opportunity to receive a lump sum payment of $500,000 or receive payments of $25,000 a year for 20 years. Which method of payment would you prefer? Use the appropriate mathematical investment models to explain your reasoning.

3. compute present value, future value, and annuities, and apply these to investments.

   Example:

   You would like to retire in 40 years with $2,000,000. How much would you have to invest each month to achieve your goal if the average rate of return on your investments is 8%, compounded monthly?

Example:

Assume that you have retired at age 65 with $1,000,000 and are earning 5% interest on your retirement savings. Assume that your expenses are currently $8,000 a month and the rate of inflation will average 4% per year. When will you run out of money?

4. understand the banking system, including the Federal Reserve, and how it affects individuals and the nation.

Example:

What does it mean when the Federal Reserve Board lowers (or increases) interest rates? What happens to money that has been deposited in a bank?