

Decision Making in Finance: Future Value of an InvestmentVI.A Student Activity Sheet 3: Time Value of Money

The future value of an investment is the amount it will be worth after so many months or years of earning interest. The following table lists a savings account's future values in selected years.

Year	Balance
0	\$2,600.00
5	\$3,201.50
10	\$3,942.20
15	\$4,854.16
20	\$5,977.16
25	\$7,359.95
30	\$9,062.70

1. Create a scatterplot of the given data. Label the axes and scales, and provide a title.

What type of function would best model the data? Explain your reasoning.

2. Calculate the regression equation for the given data. Graph the regression equation on the scatterplot in Question 1.

3. According to the model, what is the interest rate of the savings account?

Is the interest simple or compound? How do you know?

4. Using the model, how much will be in the account in 50 years?

5. Use the regression equation from the previous problems to write a general formula for future value of an investment compounded annually. Use the following variables:

- ***FV*** for future value
- ***t*** for time (in years)
- ***i*** for interest rate (in decimal form)
- ***PV*** for the principal or present value

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6. All of the investments so far have compounded and paid interest annually. However, some investments compute interest in compounding periods that are quarterly or monthly. If the annual interest rate is divided evenly, how would the interest rate be calculated for each compounding period?
7. Write a general formula for future value that takes into account any compounding period. Use the variables from Question 5, in addition to n for number of compound periods in one year.
8. Suppose you invest \$2,600 into a savings account with a 4.25% annual interest rate that compounds interest quarterly. Use the formula you wrote in Question 7 to determine the balance in the account after five years.
9. How much would the same savings account be worth in 50 years if the interest is compounded quarterly?
10. **REFLECTION:** Is there a difference between the account balance in Question 8 and the account balance from the problem described in the table? If so, is the difference large or small? How might this difference influence your decision about investments?
11. **REFLECTION:** Is there a difference between the account balance in Question 9 and the account balance in Question 4? If so, is the difference large or small? How might this difference influence your decision about investments?
12. **EXTENSION:** Research interest rates for a savings account, checking account, and money market account at different financial institutions. Note the compounding period for each.

How much would \$10,000 be worth in each account in 50 years?