

Decision Making in Finance: Present Value of an Investment

VI.B.5: A Cool Tool!

Vanessa is a financial planner specializing in retirement savings. She realizes the importance of using mathematical formulas and the appropriate tools to help her clients understand the reasoning behind the advice she is giving.

One of her favorite tools is a time-value-of-money (TVM) calculator. In Student Activity Sheet 4, you met Josephine, one of Vanessa’s clients who wanted to retire with \$1 million in savings.

1. In Josephine’s initial situation, she plans to retire in 50 years with \$1 million in savings. Vanessa advised her to find an account that earned at least the current rate of inflation. Use this information to complete the table below.

Variable	Definition of Variable	Value in Josephine’s Situation
<i>FV</i>	future value, or value of the investment at maturity	
<i>t</i>	number of years of investment until maturity	
<i>i</i>	annual interest rate (as a decimal)	
<i>PV</i>	principal, or present value	
<i>n</i>	number of compounding periods per year	

Vanessa uses a TVM calculator to help Josephine understand how the different variables affect one another.

2. Identify the values in Josephine’s situation for each variable that the TVM calculator uses.

Variable	Definition of Variable	Value in Josephine’s Situation
<i>N</i>	number of compounding periods between the time of investment and the time of retirement	
<i>I%</i>	annual interest rate (as a percent)	
<i>PV</i>	principal, or present value	?????
<i>PMT</i>	amount of each regular payment	
<i>FV</i>	future value, or value of the investment at	
<i>P/Y</i>	number of payments per year (usually the same as the number of compounding periods per year,	
<i>C/Y</i>	number of compounding periods per year	

Josephine must invest

\$ _____

Use the TVM calculator to answer the following questions for some of Vanessa's other clients.

3. Reginald wants to find the future value of an investment of \$6,000 that earns 6.25% compounded quarterly for 35 years.

Variable	Definition of Variable	Value in Reginald's Situation
<i>N</i>	number of compounding periods between the time of investment and the time of retirement	
<i>I%</i>	annual interest rate (as a percent)	
<i>PV</i>	principal, or present value	
<i>PMT</i>	amount of each regular payment	
<i>FV</i>	future value, or value of the investment at maturity	
<i>P/Y</i>	number of payments per year (usually the same as the number of compounding periods per year, <i>C/Y</i>)	
<i>C/Y</i>	number of compounding periods per year	

Reginald will have

\$ _____

after 35 years.

4. Hilda wants to have \$10,000 in 10 years after investing in an account that earns 3.6% compounded monthly.

Variable	Definition of Variable	Value in Hilda's Situation
<i>N</i>	number of compounding periods between the time of investment and the time of retirement	
<i>I%</i>	annual interest rate (as a percent)	
<i>PV</i>	principal, or present value	
<i>PMT</i>	amount of each regular payment	
<i>FV</i>	future value, or value of the investment at maturity	
<i>P/Y</i>	number of payments per year (usually the same as the number of compounding periods per year, <i>C/Y</i>)	
<i>C/Y</i>	number of compounding periods per year	

Hilda must invest

\$ _____

5. Juan wants to invest \$1,250 in an account that earns 2.34% interest, compounded monthly. How many years will it take for the account to have a value of \$5,000?

Variable	Definition of Variable	Value in Juan's Situation
<i>N</i>	number of compounding periods between the time of investment and the time of retirement	
<i>I%</i>	annual interest rate (as a percent)	
<i>PV</i>	principal, or present value	
<i>PMT</i>	amount of each regular payment	
<i>FV</i>	future value, or value of the investment at maturity	
<i>P/Y</i>	number of payments per year (usually the same as the number of compounding periods per year, <i>C/Y</i>)	
<i>C/Y</i>	number of compounding periods per year	

Juan will
have \$5,000
in _____
years.

6. Use the Future Value equation with the values given in problem #5 to solve for “t”: