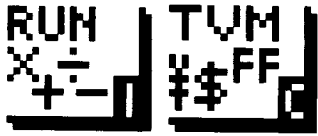


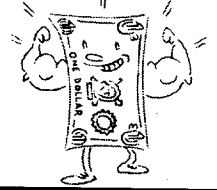
Buying Manhattan

Compound Interest Investing Money



Standards: Problem Solving, Communication, Reasoning, Connections, Algebra, and Functions

Materials: CFX-9850G or CFX-9850Ga PLUS



Calculator Menus: RUN and TVM

Variables Used in the Compound Interest Menu

- n = number of compound periods
- I = annual interest rate
- PV = Present Value
Loan amount or Initial Investment
- PMT = payment of each installment
- FV = Future value principal plus interest for investment and 0 for ending loan amount
- P/Y = Payments per year
- C/Y = Compounds per year

Using Exponential Notation in the TVM Menu

The calculator will use exponential notation to display large numbers. The value 9.943183186E+10 as shown below is notation for 99,431,831,860.

Compound Interest:End
FV =9.943183186E+10

REPT FMT GRPH

Investing money *early* is an important step towards financial independence in your future. That is the best advice anyone can ever give you. A small amount of money, invested early, can amass to a profitable sum in years to come.

In 1626, Peter Minuit is said to have purchased the island of Manhattan (New York City) for \$24 dollars worth of beads from the local Native Americans.

Do you think Peter made a wise investment or did the Native Americans get the better end of that deal? Justify your reasoning. **A.**

Suppose Peter invested the \$24 dollars in a bank in England at an annual interest rate of 6%, compounded monthly. If he left the money in the bank until 1996, estimate how much money he would have accumulated? **B.**

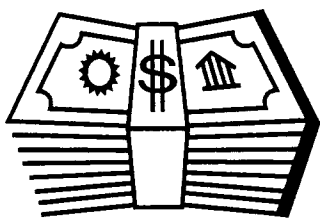
To calculate the value in Peter's account in 1996, enter the TVM Menu and press F2 for the Compound Interest screen. Enter:

- n = 370 x 12 (370 years x 12 months per year), EXE
- I% = 6, EXE
- PV = negative price of your investment (-24, this value is negative because you are giving the bank money)
- PMT = 0, EXE
- FV = 0 (the future value or balance at the end the investment is not yet known), EXE
- P/Y = 12 (12 periods per year)
- C/Y = 12 (the bank will compound the interest on the investment 12 times per year or once a month)

Press F5 (FV) to find the future value of the investment at the end of the year 1996. What is the amount of money in Peter's account? **C.**

How close was your estimate in **B**? **D.**

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How much money would be in Peter's account at the end of the following years?

- | | | | |
|-----------|------------|-----------|------------|
| E. | 1636 _____ | F. | 1646 _____ |
| G. | 1676 _____ | H. | 1726 _____ |
| I. | 1776 _____ | J. | 1826 _____ |
| K. | 1876 _____ | L. | 1926 _____ |
| M. | 1976 _____ | N. | 1996 _____ |

What do you notice about the increase in value of Peter's account at the end of each year? When are the greatest increases in value to his account. **O.**

Suppose you invested 300 dollars right now in the stock market. A good investment would yield a 10% annual yield per year.

How much money would your stock be worth in 60 years? **P.**

Is this a worthwhile investment on your money? Why or why not? **Q.**

If your parents wanted to invest an amount of money at your birth to pay for your college tuition when you turned 18, how much money do you think the initial investment would have to be if your parents got an 8% annual return? Assume that the total cost for tuition for 4 years is \$50,000 **R.**

Enter the compound interest portion of the TVM Menu. Enter:

- | | | | |
|-----|---|---|-----|
| n | = | 18 x 12 (18 years x 12 months per year), | EXE |
| I% | = | 8, | EXE |
| PV | = | 0 (this is unknown), | EXE |
| PMT | = | 0, | EXE |
| FV | = | 50000, | EXE |
| P/Y | = | 12 (12 periods per year), | EXE |
| C/Y | = | 12 (the bank will compound the interest on the investment 12 times per year or once a month), | EXE |

Press F3 (PV) to find the present value of the money invested at your birth.

How much money was needed? **S.**

What college, if any, do you want to attend? **T.**

Do you think the cost of your tuition will be less than or greater than \$50,000 for 4 years? Justify your reasoning by researching the college or university. **U.**

Finding the Future Value of an Investment

In the TVM menu enter:

n = years x months per year investment is compounded

I = annual interest rate

PV = Present Value of the Initial Investment

PMT = 0

FV = 0

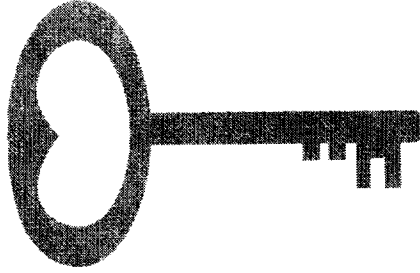
P/Y = Period per year (which will usually be the same as C/Y)

C/Y = Compounds per year

Press F5 (FV)



Solution Key



Buying Manhattan

A. - B. Answers will vary.
E. \$43.67
H. \$9,538.62
K. \$75,578,194.23
N. \$99,431,831,860
O. Answers will vary
S. \$11,903.13

C. \$99,431,831,860
F. \$79.44
I. \$190,161.42
L. \$1,506,723,511
P. \$118,056.72
T. - U. Answers will vary

D. Answers will vary.
G. \$478.46
J. \$3,791,049.52
M. \$3,003,797,276
Q. - R. Answers will vary