An INTERESTing Problem

You have a chance to invest $10,000 in one of three ways

1 the entire amount at 5% p.a. compounded annually for 15 years.

2 the entire amount at 6% p.a. compounded semi-annually for 10 years.

3 depositing $250 every 3 months for 10 years into an account where interest is paid quarterly at 7% p.a.

You need to produce a report that includes the following:

a) A table indicating the value of each investment at the end of each time period.
i.e. annually, semi-annually, quarterly)

b) One graph indicating the value of each investment over the course of the investment. Comment on the shape of each line that is plotted on the graph.

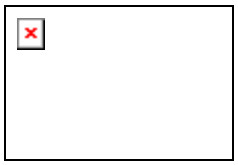
c) Which investment choice would you make. Justify your answer.

d) How much LONGER would it take for the choices that produce the lesser amount of interest, to make the same amount as the investment that produces the most?

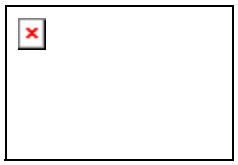
e) What interest rate would need to be charged on the choice producing the lesser amount of interest to ensure all choices produce the same amount of money in the given time periods.

To find the amount of money at the end of the given time use the APPS key and select Finance followed by 1:TVM Solver. Enter data as in figures in first column and use ALPHA (blue green key) SOLVE (found on ENTER key)

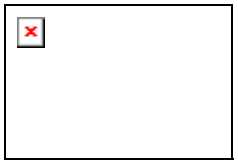
1. 5% p.a. compounded annually for 15 years



2. 6% p.a. compounded semi-annually for 10 years



3. deposit $250 every three months at 7% p.a. compounded quarterly for 10 years



How to create tables

To create a graph , you can use one of two methods. For both methods use the **TVM Solver** first, then proceed with either method 1 or method 2

Method 1: Using TABLES

1. To create a table, press the Y= key.

2. To create a table for the interest earned use:
   2nd [FINANCE] and choose A:3Int

3. To create a table for principal enter -bal(X,X)

Method 2: Using Lists

1. Use the STAT key to access the Lists

2. At the top of List 1 enter seq(A,A,1,15)
seq(is found in the OPS menu of 2nd [LIST] key (This will give the number of periods used in the calculation)

3. For a table showing interest earned: At the top of List 2 enter seq(3Int(D,D),D,1,15)

4. To create a table for principal enter - seq(bal(B),B,1,15) at the top of LIST 3

a) Tables

L1 = compounding period
L2 = interest earned
L3 = principal

1. 1. 5% p.a. compounded annually for 15 years

2. 6% p.a. compounded semi-annually for 10 years

3. deposit $250 every three months at 7% p.a. compounded quarterly for 10 years

b Graphs

1. 5% p.a. compounded annually for 15 years

2. 6% p.a. compounded semi-annually for 10 years

3. deposit $250 every three months at 7% p.a. compounded quarterly for 10 years

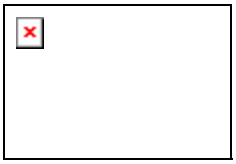
d) To find out how much longer would it take for choices 2 and 3 to earn the same amount of money as choice 1:

Use the TVM Solver and solve for N

2.

It would require 24.75 investment periods - 4.75 more than the original investment which results in almost 2.5 extra years of payments.

3.



It would require 51 payments - 11.8 payments more than the original investment which results in almost 3 extra years of payments

e) What investment rate should be used by choices 2 and 3 to earn the same amount of money as choice 1 in the time period given:

2.

The interest rate should be approximately 7.45%

3.

The interest rate should be approximately 13.7%