7F – Interest Rates over Different Time Periods and Effective Interest Rate

**INTEREST RATE CONVERSIONS**

Interest rates are usually quoted as annual rates, also called \_\_\_\_\_\_\_\_\_\_\_\_\_\_ rates.

In reality, compound interest is often calculated over the following shorter time periods:

QUARTERLY: Divide the nominal rate by \_\_\_\_

MONTHLY: Divide the nominal rate by \_\_\_\_

FORTNIGHTLY: Divide the nominal rate by \_\_\_\_

WEEKLY: Divide the nominal rate by \_\_\_\_

DAILY: Divide the nominal rate by \_\_\_\_

Once you have worked out the interest rate per compounding period, the value of the common ration can be worked out in the usual way:

Alternately, there is a general formula that can work out R from the nominal interest rate:

where: p is the number of compounding periods per year

*If $5000 is invested at a nominal compound interest rate of 4.5 % per annum, work out the common ratio based upon:*

1. *Monthly compounding periods*
2. *Weekly compounding periods*

7F – Interest Rates over Different Time Periods and Effective Interest Rate

Interest rates over different compounding periods can be used in both recurrence relations and explicit rules for compound interest (geometric growth):

*$10000 is invested at a nominal compound interest rate of 9% per annum, calculated fortnightly.*

1. *Determine the value of the common ratio*
2. *Write a recurrence relation for this investment and use NestList to calculate its value over the first five fortnightly periods*
3. *Write an explicit rule for this investment and use the rule to calculate its value after 4 years*

**EFFECTIVE INTEREST RATE**

To compare interest rates over different compounding periods, it is necessary to

convert them to an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ interest rate.

This is achieved by calculating the amount of interest earned in the first year and

then expressing this as a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the initial amount invested.

*$5000 is invested at 4.8% per annum compounding quarterly.*

1. *Determine the value of the common ratio:*
2. *Work out the investment value after 1 year (using your preferred method):*
3. *Divide the INTEREST EARNED in the first year by the initial value of the investment and express this as a percentage (the* ***effective interest rate****):*