

Seichimh agus sraitheanna

Sequences and series

Is é T_n an n^{th} téarma iontu seo, agus is é S_n suim na chéad n téarma.

In the following, T_n is the n^{th} term, and S_n is the sum of the first n terms.

Seicheamh combhbheise nó sraith chombhbheise

Arithmetic sequence or series

nuair:
is é a an chéad téarma, agus
is é d an chombhbheis

$$T_n = a + (n-1)d$$

$$S_n = \frac{n}{2}[2a + (n-1)d]$$

where:
 a is the first term
 d is the common difference

Seicheamh iolraíoch nó sraith iolraíoch

Geometric sequence or series

nuair:
is é a an chéad téarma, agus
is é r an comhiolraitheoir

$$T_n = ar^{n-1}$$

$$S_n = \frac{a(1-r^n)}{1-r}$$

where:
 a is the first term
 r is the common ratio

nuair a thugtar $|r| < 1$

$$S_\infty = \frac{a}{1-r}$$

given $|r| < 1$

Matamaitic an airgeadais

Financial mathematics

Iontu seo a leanas, is é t an fad ama ina bhlianta agus is é i an ráta bliantúil úis, dímhéasa nó fáis, agus é sloinnte mar dheachúil nó mar chodán (ionas go seasann $i = 0.08$ do ráta 8%, mar shampla)*.

In all of the following, t is the time in years and i is annual rate of interest, depreciation or growth, expressed as a decimal or fraction (so that, for example, $i = 0.08$ represents a rate of 8%)*.

Ús iolraithe

$F =$ luach deiridh, $P =$ príomhshuim

$$F = P(1+i)^t$$

Compound interest

$F =$ final value, $P =$ principal

Luach láithreach

$P =$ luach láithreach, $F =$ luach deiridh

$$P = \frac{F}{(1+i)^t}$$

Present value

$P =$ present value, $F =$ final value

Dímheas

– modh an chomhardaithe laghdaithe

$F =$ luach déanach, $P =$ luach tosaigh

$$F = P(1-i)^t$$

Depreciation
– reducing balance method
 $F =$ later value, $P =$ initial value

Dímheas

– an modh dronlíneach

$A =$ méid an dímhéasa bhliantúil
 $P =$ luach tosaigh, $S =$ dramhluach
 $t =$ saolré eacnamaíoch fhónta

$$A = \frac{P-S}{t}$$

Depreciation
– straight line method
 $A =$ annual depreciation amount
 $P =$ initial value, $S =$ scrap value
 $t =$ useful economic life

*Bíonn feidhm ag na foirmlí sin freisin nuair a bhítear ag athiolarú i gceann eatraimh chothroma seachas blianta. Sa chás sin, déantar t a thomhas sa tréimhse chuí ama, agus is é i an ráta don tréimhse.

*The formulae also apply when compounding at equal intervals other than years. In such cases, t is measured in the relevant periods of time, and i is the period rate.

Amúchadh – morgáistí agus iasachtaí
(aisíocaíochtaí cothroma i gceann eatraimh
chothroma)
 A = méid na haisíocaíochta bliantúla
 P = príomhshuim

$$A = P \frac{i(1+i)^t}{(1+i)^t - 1}$$

Amortisation – mortgages and loans
(equal repayments at equal intervals)

A = annual repayment amount
 P = principal

Ráta céatadánach bliantúil (RCB)
– foirmle reachtúil

Is ionann an RCB agus luach i (agus é sloinnte ina chéatadán) nuair is ionann suim luachanna reatha na n -airleacan uile agus suim luachanna reatha na n -aisíocaíochtaí uile. Is é sin, luach i áit a bhfuil:

$$\sum_{k=1}^N \frac{A_k}{(1+i)^{T_k}} = \sum_{j=1}^n \frac{R_j}{(1+i)^{t_j}}$$

nuair:

is é N líon na n -airleacan
is é n líon na n -aisíocaíochtaí
is é A_k méid an airleacain k
is é R_j méid na haisíocaíochta j
is é T_k an fad ama ina bhlianta go dtí airleacan k
is é t_j an fad ama ina bhlianta go dtí aisíocaíocht j

Annual percentage rate (APR)
– statutory formula

The APR is the value of i (expressed as a percentage) for which the sum of the present values of all advances is equal to the sum of the present values of all repayments. That is, the value of i for which:

where:

N is the number of advances
 n is the number of repayments
 A_k is the amount of advance k
 R_j is the amount of repayment j
 T_k is the time in years to advance k
 t_j is the time in years to repayment j

Tréimhse eile iolraithe a thiontú
ina ráta bliantúil

$$i = \left(1 + \frac{r}{m}\right)^m - 1$$

nuair

is é i an ráta bliantúil iarbhír (mar dheachúil)
is é r an ráta bliantúil ainmniúil (mar dheachúil)
is é m líon na dtréimhsí athiolraithe in aon bhliain amháin

Converting to annual rate from other
compounding period

where

i is the actual annual rate (as a decimal)
 r is the nominal annual rate (as a decimal)
 m is the number of compounding periods in one year

Athiolrú leanúnach

$$F = Pe^{rt}$$

$$i = e^r - 1$$

$$r = \log_e(1+i)$$

nuair

is é F an luach deiridh
is é P an príomhshuim
is é r an ráta bliantúil ainmniúil
is é i an ráta bliantúil iarbhír

Continuous compounding

where

F is the final value
 P is the principal
 r is the nominal annual rate
 i is the actual annual rate