Definitions

amortisation: The paying off of a loan in regular instalments over a period of time.

annuity: An investment that has regular and constant payments over a period of time.

annuity investment: An investment that has regular deposits made over a period of time, resulting in the growth of the principal amount.

depreciation: The estimated loss in value of assets as a result of factors including wear and tear, advances in technology, or a lack of demand for those specific items.

effective (annual) interest rate: A rate used to compare the annual interest between loans with different compounding periods, such as daily, weekly or monthly: $r_{\text{eff}} = \left[\left(1 + \frac{r}{100 \cdot n}\right)^n - 1\right] \times 100\%$

effective life: The length of time that an asset is useful to a business.

flat rate loans: A loan that charges 'flat rate interest' (see simple interest).

future value: The future value of an asset based on the original cost less depreciation.

interest only loans: A loan where the borrower makes only the minimum repayment equal to the interest charged on the loan.

perpetuity: An annuity where a permanently invested sum of money provides regular payments which continue indefinitely.

scrap value: The amount at which an asset is removed from the books of a company as it is considered effectively worthless. Also called the '**write-off value**'.

simple interest: Interest calculation based on the original amount borrowed or invested. It is a constant amount; also known as '**flat rate interest**'.

superannuation: A fund into which money is contributed by working Australian's employers, and optionally topped up by the employee, each pay period, for use in retirement.

reducing balance depreciation: A method of depreciation where the value of an asset is reduced by a fixed percentage of its previous value. This is an application of compound interest; sometimes called '**diminishing value depreciation**'.

reducing balance loans: A loan in which interest is usually charged every month by the financial institution and repayments are made by the borrower on a regular basis. These repayments are larger than the interest for that time period, hence the amount still owing is reduced each time.

unit cost method: A method of depreciating an asset according to its use; the more it is used the faster it will depreciate: $V_n = V_0 - nd$

Formulas

Recursive formulas – used to find the next term given the current term starting from the initial term V_0

Increasing progression (growth)	Decreasing progression (decay)
Simple interest $V_{n+1} = V_n + d$ where $d = \frac{V_0 \cdot r}{100}$	Flat rate depreciation $V_{n+1} = V_n - d$ where $d = \frac{V_0 \cdot r}{100}$
Compound interest $V_{n+1} = V_n \cdot R$ where $R = \left(1 + \frac{r}{100}\right)$	Reducing balance depreciation $V_{n+1} = V_n \cdot R$ where $R = \left(1 - \frac{r}{100}\right)$
Annuity investments $V_{n+1} = V_n \cdot R + d$ where $R = \left(1 + \frac{r}{100}\right)$ and d is the regular payment	Reducing balance loans $V_{n+1} = V_n \cdot R - d$ where $R = \left(1 + \frac{r}{100}\right)$ and d is the regular payment

General formulas – used to find any term given the initial term

Increasing progression (growth)	Decreasing progression (decay)
Simple interest $V_n = V_0 + d \cdot n$ where $d = \frac{V_0 \cdot r}{100}$	Flat rate depreciation $V_n = V_0 - d \cdot n$ where $d = \frac{V_0 \cdot r}{100}$
Compound interest $V_n = V_0 \cdot R^n$ where $R = \left(1 + \frac{r}{100}\right)$	Reducing balance depreciation $V_n = V_0 \cdot R^n$ where $R = \left(1 - \frac{r}{100}\right)$
Annuity investments $V_n = V_0 \cdot R^n + \frac{d \cdot (R^n - 1)}{R - 1}$ where $R = \left(1 + \frac{r}{100}\right)$ and d is the regular payment	Reducing balance loans $V_n = V_0 \cdot R^n - \frac{d \cdot (R^n - 1)}{R - 1}$ where $R = \left(1 + \frac{r}{100}\right)$ and d is the regular payment

KEY:

Symbol	Recursive definition	Application to financial modeling
V_n	the current V	value (price) at n
V_{n+1}	the next V	value (price) at $n + 1$
V_0	the initial V	original amount • principal amount • borrowed amount
d	common difference	regular increase/decrease • regular payment amount • unit cost depreciation
R	common ratio	compounding factor • $\left(1 + \frac{r}{100}\right)$ or $\left(1 - \frac{r}{100}\right)$ where r is the nominal interest rate