Examples of Annuities

Ordinary Annuity (payments at the end of each period)

Example: You deposit $500 at the end of each month into a savings account for 5 years.

Formula for Present Value (PV):

$$PV = 500 \cdot \frac{1 - (1 + 0.01)^{-60}}{0.01}$$

(assuming 1% monthly interest).

Annuity Due (payments at the beginning of each period)

Example: You pay $200 at the beginning of each month for a gym membership plan that lasts 2 years.

The present value of an annuity due is slightly higher than an ordinary annuity because payments are made earlier.

Life Annuity

Example: A retiree buys an annuity that pays $1,000 per month for life.

Actuaries use mortality tables to estimate how long payments will continue.

Perpetuity (infinite payments)

Example: A scholarship fund pays $5,000 every year forever to a student.

Present Value Formula:

$$PV = \frac{5000}{r}$$

where r is the annual interest rate.

Deferred Annuity

Example: You invest in a plan today, but payments of $2,000 per month start only after 10 years.

Deferred annuities are useful for retirement planning when income is needed at a later stage of life.