

MAT 121  
MATHEMATICS FOR BUSINESS AND INFORMATION SCIENCE  
LECTURE 33

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**5.2 — Annuities**

The formula for **future value of an annuity** is

$$S = R \left( \frac{(1+i)^n - 1}{i} \right),$$

where  $S$  = Future value of an annuity;

$R$  = Recurrent payment at the end of each investment period;

$i$  = Effective interest rate in one investment period;

$n$  = Number of investment periods.

The formula for **present value of an annuity** is

$$P = R \left( \frac{1 - (1+i)^{-n}}{i} \right),$$

where  $P$  = Present value of an annuity;

$R$  = Recurrent payment at the end of each investment period;

$i$  = Effective interest rate in one investment period;

$n$  = Number of investment periods.

**5.3 — Amortization and sinking funds**

The formula for **amortization** is

$$R = \frac{Pi}{1 - (1+i)^{-n}},$$

where  $P$  = Current loan;

$R$  = Recurrent payment at the end of each installment period;

$i$  = Effective interest rate in one installment period;

$n$  = Number of installment periods.

The formula for **sinking fund** is

$$R = \frac{Si}{(1+i)^n - 1},$$

where  $S$  = Fund accumulated at the end;

$R$  = Recurrent payment at the end of each investment period;

$i$  = Effective interest rate in one investment period;

$n$  = Number of investment periods.