Finance Basic Formulas

Simple Interest

Formula

$$SI = \frac{P \times R \times T}{100}$$

SI → simple interest

P → principal amount

R → interest rate per year

T → time in years

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Compound Interest

Formula

$$CI = P\left(1 + \frac{r}{n}\right)^{nT}$$

- CI → compound interest
- P → principal amount
- r → R / 100
- R → interest rate
- T → time in years
- n → number of compounding frequency per year

getcalc.com

Mortgage

Formula

$$\text{Mortgage}_{\text{monthly}} = \text{Principal} \times \frac{r(1+r)^n}{(1+r)^n - 1}$$

- r ⟶ R / 100
- R ⟶ interest rate
- n ⟶ number of months or periods

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Equated Monthly Instalment

Formula

$$EMI = \frac{P \times r \times (1+r)^n}{(1+r)^n - 1}$$

EMI → Equal Monthly Instalment

r → R /100

R → interest rate

P → principal amount

n → total number of months

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Certificate of Deposit

Formula

$$CD = P\left(1 + \frac{r}{n}\right)^{nT}$$

- CD → Certificate of Deposit
- P → principal amount
- r → R /100
- R → interest rate
- T → time in years
- n → number of compounding per year

Annual Percentage Rate

Formula

$$APR\ (\%) = \frac{\frac{Principal \times Rate \times Years}{100} + Additional\ Charges}{(Principal \times Years)} \times 100$$

APR	→	Annual Percentage Rate
Principal	→	loan amount
Rate	→	interest rate per year
Years	→	number of periods or years

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Annual Effective Rate

Formula

$$\text{AER}\ (\%) = \left[\left(1 + \frac{r}{n} \right)^{n} - 1 \right] \times 100$$

AER ⟶ Annual Effective Rate

r ⟶ R / 100

R ⟶ interest rate

n ⟶ number of compounding per year

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Present Value

Formula

$$PV = \frac{FV}{(1+r)^n}$$

PV → Present Value

FV → future value

r → R / 100

R → interest or discount rate

n → number of periods or years

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Future Value

Formula

$$FV = PV \times (1 + r)^n$$

FV ⟶ Future Value

PV ⟶ present value

r ⟶ R / 100

R ⟶ interest or discount rate

n ⟶ number of periods or years

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Net Present Value

Formula

$$NPV = \left(\sum_{t=1}^{n} \frac{\text{Net Cash Inflow}_t}{(1+r)^t} \right) - \text{Initial Investment}$$

NPV	⟶	Net Present Value
t	⟶	time in years
r	⟶	R / 100
R	⟶	interest or discount rate
n	⟶	number of periods or years

Inflation

Formula

$$\text{Inflation (\%)} = \left(\frac{\text{Current CPI} - \text{Initial CPI}}{\text{Current CPI}} \right) \times 100$$

CPI ⟶ consumer price index

Annuity

Formula

$$\text{Annuity} = PV \times \frac{r}{1 - (1 + r)^{-n}}$$

Annuity ⟶ Monthly Annuity Payment

r ⟶ R / 100

R ⟶ interest or discount rate

n ⟶ number of periods

Perpetuity

Formula

$$\text{PV of Perpetuity} = \sum_{n=1}^{\infty} \frac{D}{(1+r)^n}$$

$$= \frac{D}{(1+(R/100))} + \frac{D}{(1+(R/100))^2} + \ldots + \frac{D}{(1+(R/100))^n}$$

PV ⟶ Present value

D ⟶ dividend

r ⟶ R / 100

R ⟶ interest or discount rate

n ⟶ number of years

Present Value of Annuity

Formula

$$PVA = Annuity\left(\frac{1 - \frac{1}{(1+r)^n}}{r}\right)$$

$$PVA = Annuity\left(\frac{1 - \frac{1}{(1+(R/100))^n}}{R/100}\right)$$

PVA	→	Present Value of Annuity
Annuity	→	periodic annuity payment
r	→	R /100
R	→	interest or discount rate
n	→	number of periods

Future value of Annuity

Formula

$$FVA = Payment \times \left(\frac{(1+r)^n - 1}{r} \right)$$

$$FVA = Payment \times \left(\frac{(1 + (R/100))^n - 1}{R/100} \right)$$

FVA	→	Future Value of Annuity
Payment	→	periodic payment
r	→	R /100
R	→	interest or discount rate
n	→	number of periods

Fixed Deposit

Formula

$$FD = P\left(1 + \frac{r}{n}\right)^{nT}$$

- FD → Fixed Deposits
- P → Principal amount
- r → R /100
- R → interest rate
- T → time in years
- n → number of compounding frequency per year

Basic Growth Rate

Formula

$$\text{Basic Growth Rate (\%)} = \left(\frac{\text{Present Value - Initial Value}}{\text{Initial Value}} \right) \times 100$$

$$\text{Average Growth Rate (\%)} = \left[\left(\frac{\text{Present Value}}{\text{Initial Value}} \right)^{\frac{1}{n}} - 1 \right] \times 100$$

n ⟶ number of periods or years

Economy Growth Rate

Formula

$$\text{Economy Growth Rate (\%)}_{basic} = \left(\frac{GDP_{pv} - GDP_{init}}{GDP_{init}} \right) \times 100$$

$$\text{Economy Growth Rate (\%)}_{avg} = \left[\left(\frac{GDP_{pv}}{GDP_{init}} \right)^{\frac{1}{n}} - 1 \right] \times 100$$

GDP_{pv} ⟶ present value of GDP

GDP_{init} ⟶ initial value of GDP

n ⟶ number of periods or years