TIME VALUE OF MONEY.

Compound Interest :- Tricks

$$\frac{R}{100}+1 \times P = \text{Amount}.$$

↳ No. of years.

- Half yearly.

$$\frac{R}{200}+1 \times P = \text{Amount}.$$

↳ No. of Half year

- Quaritly

$$\frac{R}{400}+1 \times P = \text{Amount}.$$

↳ No. of Quarts.

- Mothly

$$\frac{R}{1200}+1 \times P = \text{Amount}.$$

↳ No. of mothhs

Note :

If the amount was given in the question then use pinto Method directly.

① **G.P** [Amount in C.I forms G.P].
↓
Same Ratio.

$P, A_1, A_2, A_3 \ldots\ldots A_n = G.P.$

($A_2 \div A_1$: r)

$A_2 \div A_1 = r.$

$$\boxed{r - 1 = i \times 100}$$

(i = Rate of interest.)

Forward = × r.

Backward = ÷ r.

$A_2, A_4, A_6, A_8 \ldots\ldots = G.P$

$$\boxed{r^{1/n} - 1 = i}$$

[It will calculate the yearly Rate of interest]

Note:

In Question any two amounts will be given and we want find either the backword or forward amount.

(2) **Difference Between C.I & S.I.**

$R = \frac{Rate}{100}$.

$CI_2 - SI_2 = P(R)^2$ → If asked for two years.

$CI_3 - SI_3 = P(R)^2 [R+3]$ → for 3 years.

Calculate Difference of C.I & S.I for "n years" and take there difference.

Note:

If the difference was given in question then use Pinto Method. (or) use formula

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(3) If Rate keeps on changing every year :-

$P + R_1\% + R_2\% + R_3\% \ldots R_n\% = A_n$.

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(4) If a sum of money amounts to "m times" in "n years" then "q years" it will amount to.

$A_q = (m)^{q/n}$ — when this is divisible.

↓ given years.

(or)

$\frac{n_1 - 1}{T_1} = \frac{n_2 - 1}{T_2}$ (or)

eg.

P → 2P
9 → ?

eg.

P 2P 4P ....
9 18 ....

Effective Rate of Interest :-

Yearly

$\frac{R}{100} + 1 \times 100(P) = -100 \Rightarrow$ Eff. Rate.

└→ 1 times.

Half yearly

$\frac{R}{200} + 1 \times P^{100} = -100 \Rightarrow$ eff. Rate.

└ 2

- Quarterly

$\frac{R}{400} + 1 \times P^{100} = -100 \Rightarrow$ eff. Rate.

└ 4

Monthly

$\frac{R}{1200} + 1 \times P^{100} = -100 \Rightarrow$ eff. Rate.

└ 12.

Depreciation

$[1 - r\%]$ Machinery Value = Scrap.

↓

estimated life of machine.

Note:

If the scrap value is given in question then use Pinto Method.

If the years are given in decimal then -

eg. $(2)^{5.2}$. $(a)^{n}$.

↓

$\sqrt{\sqrt{a}}$ $-1 \times$ Power $+1$ $\times = \times =$

↓ 12 times   ↓ given   ↓ 12 times.

Amount = $P[1+i]^{n}$.

Scrap = $MV[1-i]^{n}$.

If the Rate of interest & CI_2 & n is given in the question. and asked to find out CI_2.

Let : P = 100 + R% + R% = - 100 = Amount of interest.

$$P = \frac{100}{\text{Amount of interest}} \times CI_2$$

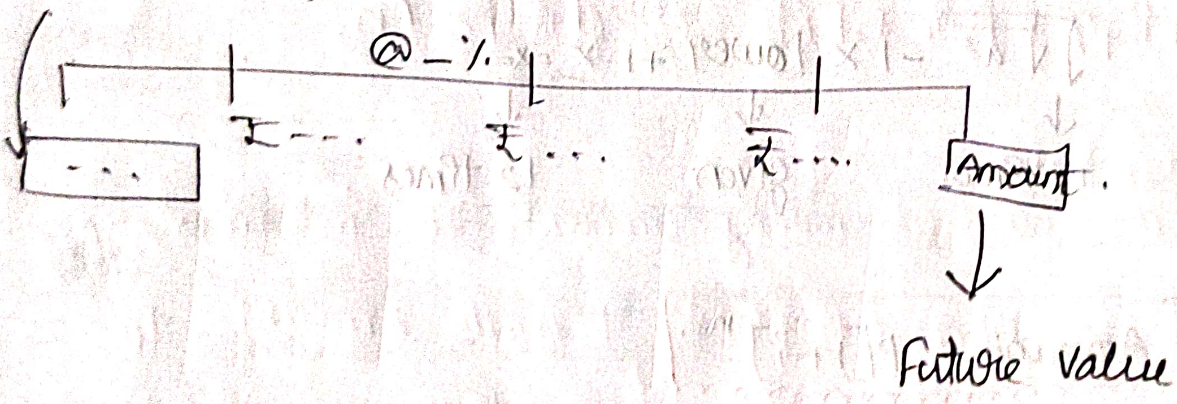
P ↓ actual principle.

Phase-2

Annuity → Any regular payment.

eg. Rent / Installment.

Present Value.



Ordinary Annuity → Payment at the end.

Annuity due → Payment at the begining.

Note:

- Question silent → ordinary.
- Start from today → Due.

Present Value

end

Annuity to Present value:

$\frac{R}{100} + 1 \div = GT \cdot \times a = PV$

↓ No. of installement

beginning — Due

$1 + \frac{R}{100} + 1 \div = GT \times a = PV$

↓ n-1

Present value to annuity.

$\frac{R}{100} + 1 \div = GT[M+] \Rightarrow \frac{PV}{MRC} = a$ or $\div \times PV$

↓ No. of installement.

Future Value:

end

Annuity to Future Value

$1 + \frac{R}{100} + 1 \times 1 = GT \times a = FV$

↓ n-1

beginning — Due

$\frac{R}{100} + 1 \times 1 = GT \times a = FV$

Future value to Annuity.

$1 + \frac{R}{100} + 1 \times 1 = GT[M+] \Rightarrow \frac{FV}{MRC} = a$ (or) $\div \times FV$

↓ n-1

Formula to compute Net Present Value :-

NPV = PVCI − PVCO → Present value of cash outflow. (आज का Value of Expense)

PVCI → Present value of cash Inflow. (आज का value of Income)

Decision आज लेना है तो सब कुछ आज की value पर होना चाहिए.

Note : use it if cash flow is same $[\frac{R}{100}+1 \div = GT \times a]$

Present value of Future Money :- [Single payment].

$\frac{R}{100}+1 \div = \times$ Amount = P.V.
↳ N

PVFM = Discounting factor of that year × Future Money.

If cash flow changes.

eg:

1	2	3	4
1000	3000	4000	6750

× D.F. M+ × D.F M+ × D.F M+ × D.F M+ MRC.

Invest or Not

+ve NPV. ✓

−ve NPV ✗.

$\frac{R}{100}+1 \div = \dots$ GT × Amount

(A)

Buy or Lease.

Buy → one time payment of certain amt.

Lease → Installment. $\left[\frac{R}{100}+1\%=GT\times a\right]$

whichever is lesser.

Valuation of Bond :-

NOB = P.V of Interest + P.V. of RV
F.V.

CAGR.

A_2 , A_8.

$\left[(r)^{1/6}-1\right]\times 100 = i$.

$$CAGR=\left[\left[\frac{\text{current value}}{\text{Initial value}}\right]^{1/\text{no. of period}}-1\right]\times 100.$$

no. of period → Given.

(No. of years = n - 1) only in table.