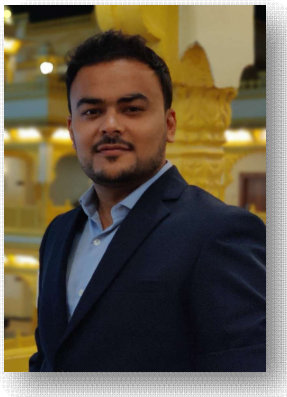
CA. Pranav Popat

→ A commerce graduate and **first attempt** Chartered Accountant, Pranav is one the youngest CA Faculties in India. He loves Public Speaking and motivating students. His unique approach of teaching helps commerce students to get rid of **"MATHS PHOBIA"**.



→ Currently, he teaches Mathematics, Statistics & Logical Reasoning (Foundation Level CA/CS) and Cost/Management Accounting (CA Inter). Students admire him for creating very **interactive learning environment** in the classroom which helps them to get more connected to the subject practically.

→ He worked with Wipro Limited for 2 years in the area of cost control and deal pricing. In his 3 years practical training, he earned exposure in the field of Auditing, Industrial Implementation and other Financial Services for various corporate as well as PSU clients.

→ His Motto in Life: When life puts you in trouble, don't say **WHY ME?** Just say **TRY ME!!!!**

Time value of money formula and tricks

Simple Interest

Formula for SI	$S.I. = \frac{P.r.t}{100}$
Formula for Accumulated Amount under SI	$A = P + SI$ (amount is also called as Balance)
Using Calculator	Press [P] [x] [r] [x] [t] [÷] [100]
Example 1: Find out SI	S.I on ₹ 3,500 for 3 years at 12% per annum is?
Example 2: Find out Rate of Interest	P = ₹ 12,000, A = ₹ 16,500, T = 2 ½ years. Rate percent per annum simple interest will be?
Example 3: Find out Time Period	P =₹ 8,500, A = ₹ 10,200, R = 12 ½ % SI, t will be?

Compound Interest

Conversion periods

Conversion Period	No. of Conversion Periods
Yearly	1
Half-yearly	2
Quarterly	4
Monthly	12
Daily	365

Formulas in C.I.

Accumulated Amount under CI	$A=P(1+i)^n$ Where, P = Principal, i = adjusted interest rate, n = no. of periods
Adjusted interest rate i	$\frac{\text{annual interest rate}}{\text{no. of conversion periods}}$ **Ex.** if rate is 6% p.a. and compounding is half yearly, i=6/2=3%
No. of periods	Time in year × no. of conversion periods. **Ex**: if time is 2 years and compounding is quarterly, n = 2×4 = 8
Calculator Trick for Amount of CI	Example: P=1000, i=10%, n=3 then Calculator Steps to obtain A: Write **P i.e 1000 then press** **+ 10 % + 10 % + 10 %** **(three times because n=3),**
Use of formula using Calculator	Example: P=1000, i = 10% = 0.1, n=3 then Calculator Steps: **1+0.1 × = = (first equal will be considered as power 2, second as 3 and so on) × 1000 (Principal)**
Note	If question is silent about conversion period, assume it to be yearly
CI Formula	$CI=P[(1+i)^n-1]$

Example 1: Calculate Amount as per CI and CI

Compute the compound interest on ₹ 4,000 for 1½ years at 10% per annum compounded half- yearly.

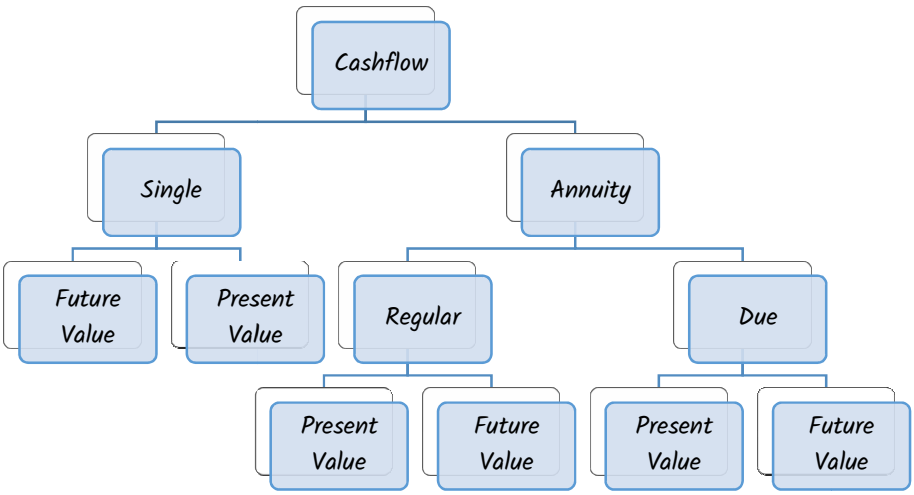
Example 2: Calculate Principal

On what sum will the compound interest at 5% per annum for two years compounded annually be ₹ 1,640?

Example 3: Calculate rate of interest	What annual rate of interest compounded annually doubles an investment in 7 years?
Example 4: Calculate Time Period	In what time will ₹ 8,000 amount to ₹ 8,820 at 10% per annum interest compounded half-yearly?

Effective rate of interest

Formula	$E=[(1+i)^n-1]$
n	here n means no. of periods in one year considering the compounding
Example:	₹ 5,000 is invested in a Term Deposit Scheme that fetches interest 6% per annum compounded quarterly. What is effective rate of interest?



Formula for Single Cash flow

Future Value of Single Cash flow	$FV=PV\ (1+i)^n$
Example:	*You invest ₹3000 in a two year investment that pays you 12% per annum. Calculate the future value of the investment*
Present Value of Single Cash flow	$PV=\frac{FV}{(1+i)^n}$
Example	*Find the present value of ₹ 10,000 to be required after 5 years if the interest rate be 9%.*

Future Value of Annuity

Formula for FV of Annuity Regular	$FVA = A_I \times [FVAF(n, i)]$ or $FVA = A_I \left[\frac{(1+i)^n - 1}{i}\right]$ A_I = amount of installment or Annuity, FVAF means future value annuity factor (it's a multiplier used to convert installment to its Future value)
Example:	₹ 200 is invested at the end of each month in an account paying interest 6% per year compounded monthly. What is the future value of this annuity after 10th payment?
Formula for FV of Annuity Due	$FVA\ Due = FVA \times (1+i)$ Calculate FVA regular normally and then multiply it by **(1+i)**
Example:	Mr. P invests ₹10,000 every year starting from today for next 10 years. Suppose interest rate is 8% per annum compounded annually. Calculate future value of the annuity.

Present Value of Annuity

Formula for PV of Annuity Regular	$PVA = A_1 \times [PVAF(n,i)]$ Type 1: $PVA = A_1 \left[\frac{(1+i)^n - 1}{i(1+i)^n}\right]$ or Type 2: $PVA = \frac{A_1}{i}\left[1 - \frac{1}{(1+i)^n}\right]$ A_1=amount of installment or Annuity, PVAF means present value annuity factor (it's a multiplier used to convert installment to its present value)
Calculator Trick of PVAF (Present Value Annuity Factor)	1+i ÷ = =.....n times GT
Example:	₹ 5,000 is paid every year for ten years to pay off a loan. What is the loan amount if interest rate be 14% per annum compounded annually?
Formula for PV of Annuity Due	PVA Regular for one shorter period + Initial Cash flow
Example:	₹ 5,000 is paid every year for ten years to pay off a loan starting from today. What is the loan amount if interest rate be 14% per annum compounded annually?