Collegedunia SNAP Formula Sheet

Quantitative, DI and DS

Simple and Compound Interest

20 Qs	60 Qs	~8 min
Quant Section Size	Total SNAP Paper	To Revise This Sheet

Simple and Compound Interest trips up students not because the formulas are hard, but because SNAP tests the gap between the two – linear growth vs. growth on growth – inside word problems, and reaching for the wrong one is where most marks are actually lost.

Every formula on this sheet comes down to the same first step: decide whether interest is being paid only on the original principal, or on the principal plus everything already earned. Get that right, and the rest is one or two lines of arithmetic.

Read a formula, work through the example given with it, then try the same formula with a different number before moving on. Knowing a formula and knowing when to reach for it are two different abilities – this sheet gives you the first, solving actual questions gives you the second.

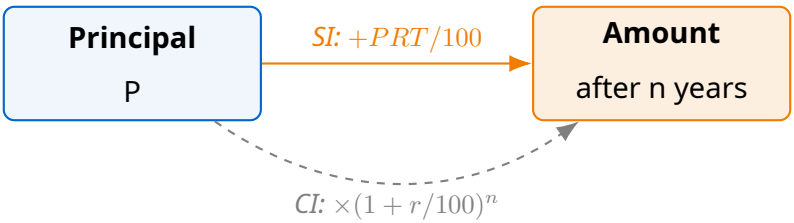
This sheet covers five formula groups:

- Simple interest
- Compound interest, once a year
- Compound interest, more than once a year
- The CI-SI difference for two years
- Effective annual rate

Which Rule Does the Wording Point To?

The stem says	Use	Then
interest stays the same amount every year	simple interest	SI $= PRT/100$
interest is added back and earns interest itself	compound interest	$A = P(1 + r/100)^n$
compounded half-yearly or quarterly	adjusted CI	halve/quarter the rate, double/quadruple n
difference between CI and SI over 2 years	CI-SI shortcut	difference $= P(r/100)^2$

Before any arithmetic, check the compounding frequency – annual, half-yearly or quarterly changes both the rate and the number of periods.



1 Simple Interest

The Base Formula

$$\text{SI} = \frac{\boldsymbol{P \times R \times T}}{\mathbf{100}}, \quad \text{Amount} = \boldsymbol{P} + \text{SI}$$

Rs. 5000 at $\mathbf{8\%}$ *for* $\mathbf{3}$ *years earns SI* $= \mathbf{5000 \times 8 \times 3/100} =$ *Rs.* $\mathbf{1200}$*, and the amount is Rs. 6200.*

Common Mistake

Simple interest is always calculated on the original principal, never on the growing amount – that distinction is exactly what separates it from compound interest.

2 Compound Interest, Once a Year

Compounding Annually

$$A = P\left(1 + \frac{r}{100}\right)^{n}, \quad \text{CI} = A - P$$

Rs. 5000 at 8% compounded annually for 2 years: $A = 5000 \times 1.08^2 = Rs.\ 5832$, so CI $= Rs.\ 832$, more than the SI of Rs. 800 over the same period.

3 Compound Interest, More Than Once a Year

Half-Yearly and Quarterly

Half-yearly: $A = P\left(1 + \frac{r/2}{100}\right)^{2n}$ Quarterly: $A = P\left(1 + \frac{r/4}{100}\right)^{4n}$

An 8% annual rate compounded half-yearly becomes 4% per half-year, applied twice as many times – never plug the annual rate and annual n directly into a half-yearly problem.

4 The CI-SI Difference

Two-Year Shortcut

$$\text{CI} - \text{SI (2 years)} = P\left(\frac{r}{100}\right)^{2}$$

At 8% for 2 years on Rs. 5000: difference $= 5000 \times (0.08)^2 = Rs.\ 32$, matching $832 - 800$ above without computing either CI or SI first.

5 Effective Annual Rate

When Compounding Beats the Stated Rate

Effective annual rate $= \left[\left(1 + \frac{r}{100k}\right)^{k} - 1\right] \times 100$, for k compounding periods a year

A stated 10% compounded half-yearly ($k = 2$) has an effective annual rate of $(1.05)^2 - 1 = 10.25\%$, always a little above the stated rate.

Quick Reference

Checked at $P = 5000$, $r = 8\%$ throughout.

Quantity	Formula	Check
Simple interest	$PRT/100$	3yr, $8\% \to$ Rs. 1200
Compound amount (annual)	$P(1 + r/100)^n$	2yr, $8\% \to$ Rs. 5832
Half-yearly compounding	$P(1 + r/200)^{2n}$	rate $\to r/2$, periods $\to 2n$
CI $-$ SI (2 years)	$P(r/100)^2$	$8\% \to$ Rs. 32
Effective annual rate	$[(1 + r/100k)^k - 1] \times 100$	10% half-yearly $\to 10.25\%$

Before you walk in. Check the compounding frequency before touching any formula – half-yearly and quarterly change both the rate and the exponent. For a quick two-year CI-SI comparison, reach for the $P(r/100)^2$ shortcut instead of computing both values separately. And remember simple interest never compounds on itself, no matter how the question is worded.