Aptitude-Simple-And-Compound-Interest

For more notes visit

https://rtpnotes.vercel.app

Reference Playlist

https://youtube.com/playlist?list=PL8p2I9GklV454LdGfDOw0KkNazKuA-6B2&feature=shared

Simple Interest

Basic Formula

Formula of Simple Interest (S.I.)

$$S.I. = \frac{P \times R \times T}{100}$$

P = Principal

R = Rate of Interest

T = Time span

- Time span is in years
- Amount = Principal + Simple Interest

Question 1

Find SI on Rs 1600 at 6% p.a for 146 days

- SI = PxRxT/100
- P = 1600rs
- Rate = 6
- Time span = 146/365
- SI = (1600x6x146/365) / 100
- SI = 38.40

Question 2

A sum at 9% per annum simple interest accounts to Rs 2921 in 3 years. Find the Sum

- We need to find the principal amount

- P + SI = 2921
- P + Px9x3 / 100 = 2921
- 127P = 292100
- P = 292100/127
- P = 2300

Question 3

A certain sum of money amounts to Rs 854 in 2 years and to Rs 969.50 in 3.5 years. Find the sum and the rate of interest

- Amount in 2years = P + SI_2 = 854
- Amount in 3.5 years = P + $SI_{3.5}$ = 969.50
- Difference = 115.5 Rs in 1.5 years
- (P x R X 3/2) / 100 = 115.5
- P x R = 7700
- Finding Principal
  - P + SI_2 = 854
  - P + P x R x 2 / 100 = 854
  - P + 7700x2/100 = 854
  - P = 700rs
- Finding Rate
  - PXR=7700
  - R = 7700/700
  - R = 11%

Question 4

At what rate percent per annum at SI will a sum of money double in 8 years?

- Given
  - Time = 8 years

    - Rate = ?
    - Amount = Principal + SI_8
    - Since money is doubled, Amount will be 2 x Principal, which means,
    - SI_8 = Principal
- PxRxT/100 = P
- RxT/100 = 1
- Rx8/100 = 1
- Rx8 = 100
- R = 100/8 = 12.5 %

Question 5

A sum of Rs 8000 was lent partly at 8% and partly at 10% per annum SI. If the total annual interest be Rs 714, Find the sum lent at 8%

- X amount is given at 8%
- 8000 - X amount is given at 10%
- x X 8 x 1 / 100 + (8000-x) x 10x1/100 = 714 (Total annual interest)
- X = 4300

Compound Interest

Concept

- In simple interest
    - Suppose
        - P = 800
        - Interest = 10%
    - Before Interest
        - P = 800
    - After 1 Year
        - P = 800 + 10% of 800 = 800 + 80 = 880

    - After 2 Years
        - P = 880 + 10% of 800 = 880 + 80 = 960
- In compound interest
    - Suppose
        - P = 800
        - Interest = 10%
    - Before Interest
        - P = 800
    - After 1 Year
        - P = 800 + **10% of 800** = 800+80 = 880
    - After 2 Years
        - P = 880 + **10% of 880** = 880 + 88 = 968
- As you can see the interest is taken of the previous result
    - For 2nd Year, the interest is based on the Prinicipal of the first year
    - **Simple Interest**: The principal amount (P) stays constant over the years, and the interest is calculated on the initial principal each time.
    - **Compound Interest**: The interest is recalculated on the new principal (which includes the previous interest).

Formula

$$A = P\left(1 + \frac{R}{100}\right)^t$$

Compounded Annually

- Here t is years
- P is principal amount
- R is rate
- If different rate of interest is provided for each year, like
  - 1st year R = 5
  - 2nd year R = 8
  - 3rd year = R =10
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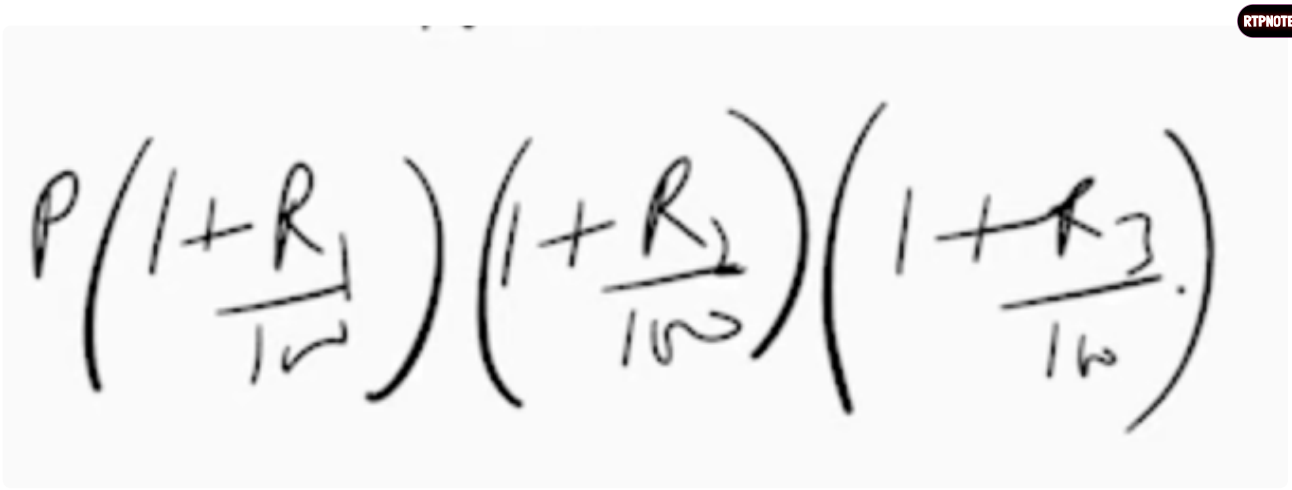
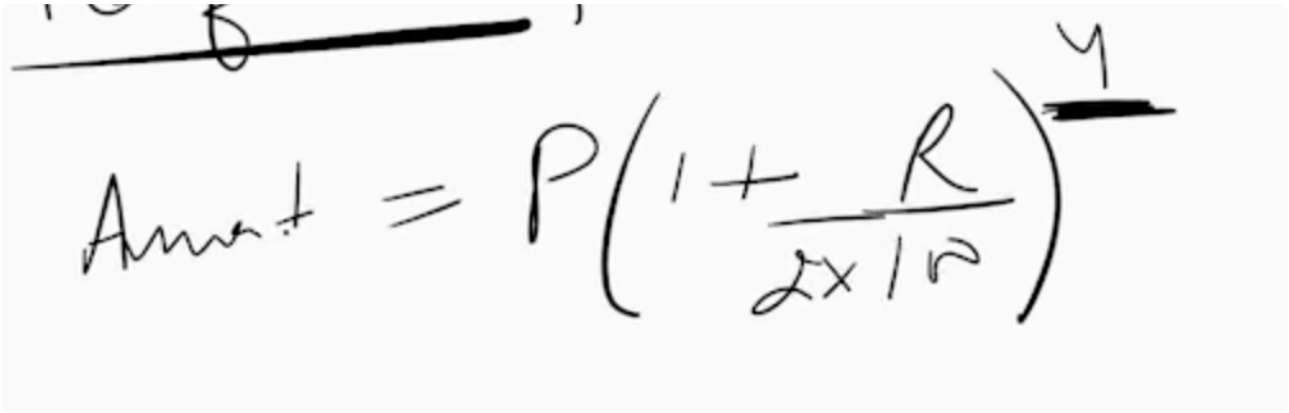
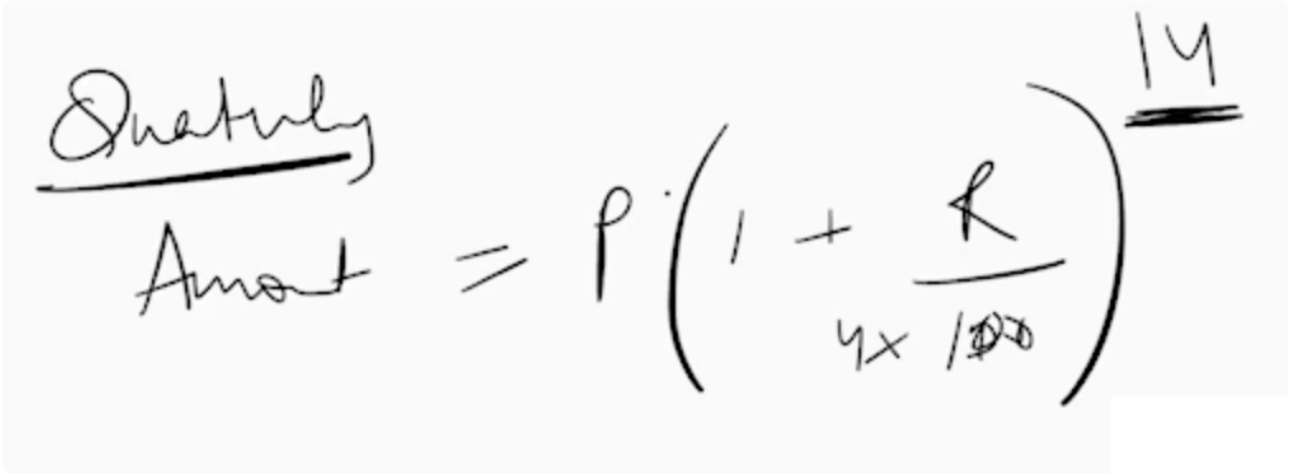


Compounded Half yearly



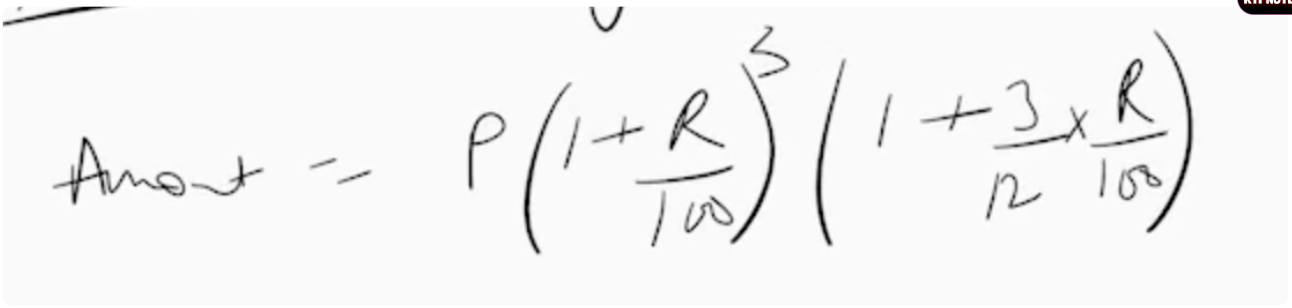
- Suppose its half yearly compounded over a span of 2 years
- It will require 4 times compounding to reach 2 years (1/2 x 4 = 2)
- Also, the Rate is multiplied by 1/2

Compounded quarterly



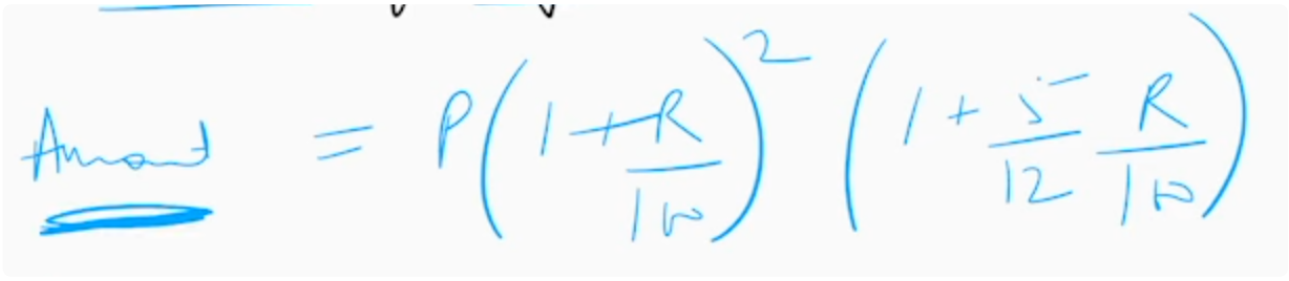
- Rate multiplied by 1/4
- Span of 3.5 years
  - 1/4 x 14 = 3.5

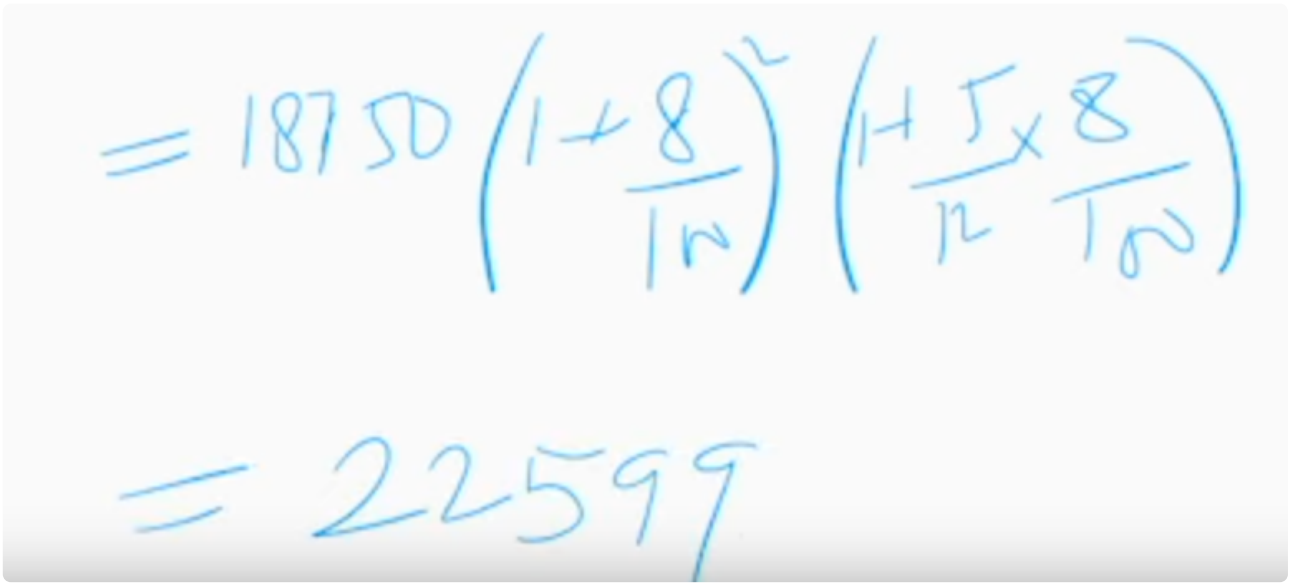
Annually: 3 years and 3 months

- 

Question 1

Find compound interest on Rs 18750 at 8% per annum for 2 years 5 months

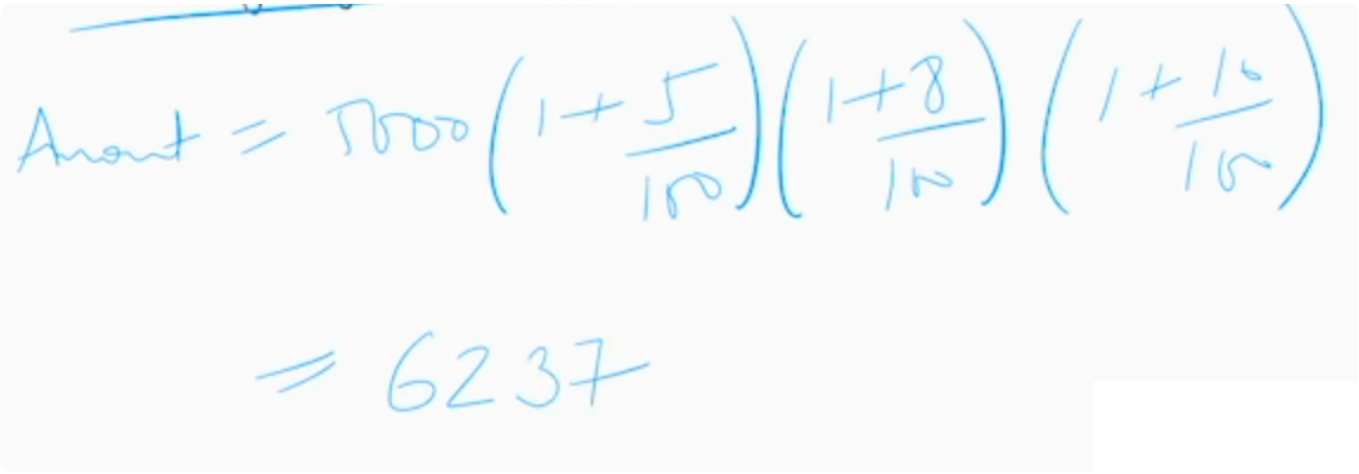
- Given
  - Rate = 8
  - Principal = 18750
- 

- 

- Compound interest = Amount - Principal
- 22599 - 18750

Question 2

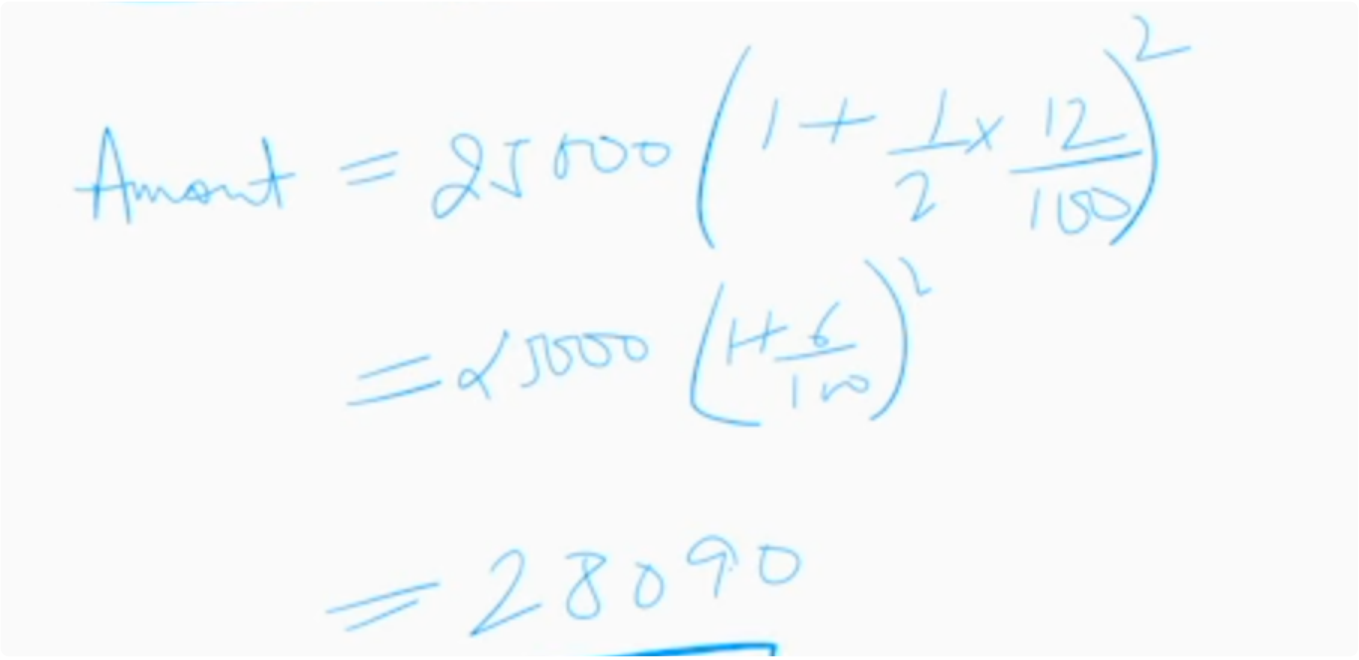
Find Compound interest on Rs 5000 for 3 years, the rate of interest being 5% during 1st year, 8% during 2nd year and 10% during 3rd year



- CI = Amount - Principal = 6237 - 5000 = 1237

Question 3

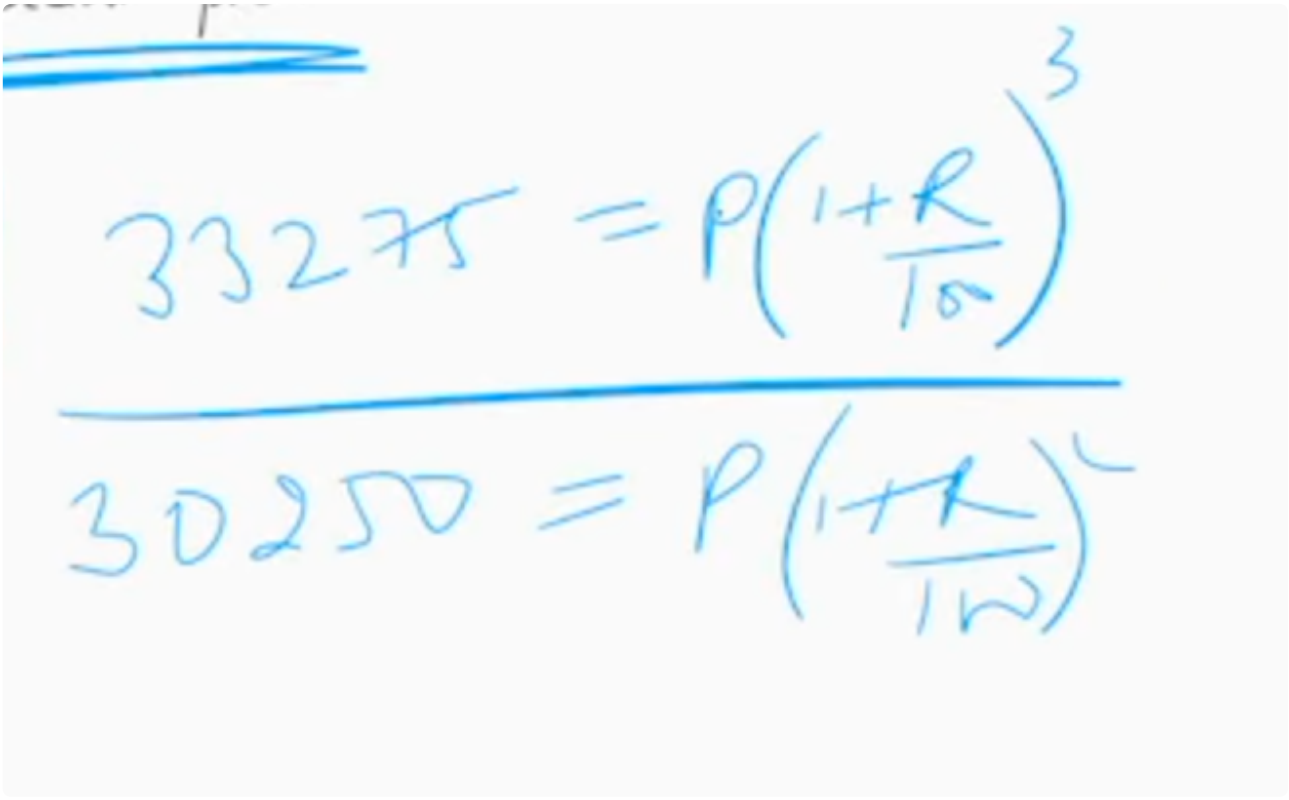
Find compound interest on Rs 25000 at 12% per annum for 1 year, compounded half-yearly



- CI = Amount - Principal = 28090 - 25000 = 3090

Question 4

A sum on compound interest amounts to Rs 30250 in 2 years and Rs 33275 in 3 years. Find the sum and rate percent p.a

- Divide both equations to get R
- 

- R = 10%
- Subbing the value and getting P

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