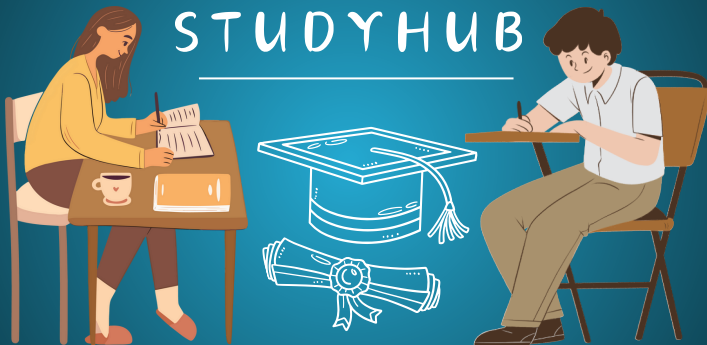


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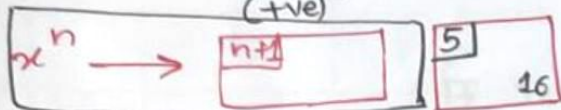
CALCULATOR TRICKS

1) +/- Used to convert positive number to Negative

2) To find square ($\sqrt{x}$) Eg: $\sqrt{9} = 3$ (9, $\sqrt{}$)

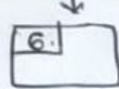
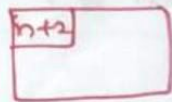
3) To calculate square (x^2) Eg: $131^2 = 17161$ (131 X =) (No. X =)

4) To find n^{th} power (x^n) Eg: $3^7 = 2187$ (3 X press(=) 6 times (7-1) times)



Eg: $2^4 = 16$. (No X press(=) (n-1) times)

5) To find n^{th} power (x^{-n}) if n is negative (-ve) Eg: $3^{-4} = 0.01234$ (3 $\div$ press(=) 4 times)



(No. $\div$ press(=) n times)

6) To find n^{th} power ($x^{7.2}$ or any other no.) if n is in points

Eg: $(1.03)^{7.2} = 1.2371$

* Type 1.03.

* $\sqrt{\sqrt{\sqrt{\dots}}}$ 12 times

* -1

* X 7.2

* +1

* X =, X =, X =

.... 12 times

• Type the given number.

• $\sqrt{\sqrt{\sqrt{\dots}}}$ 12 times

• -1

• X Given power

• +1

• X =, X =, X =, 12 times

7) To find n^{th} power $(x^{1/n})$
if n is a fraction

- Type the number.
- $\sqrt{\sqrt{\sqrt{\dots}}}$ 12 times
- $\rightarrow 1$
- $\div n$
- $+1$
- $X=, X=, X= \dots 12$ times

- $(1.03)^{1/3} = 1.00970$
- Type (1.03)
 - $\sqrt{\sqrt{\sqrt{\dots}}}$ 12 times
 - -1
 - $\div 3$
 - $+1$
 - $X=, X=, X= \dots 12$ times

8) To find n^{th} power
if n is a fraction $(x^{a/b})$

- Type the number.
- $\sqrt{\sqrt{\sqrt{\dots}}}$ 12 times
- -1
- $\times a, \div b$
- $+1$
- $X=, X=, X= \dots 12$ times

- $(1.05)^{7/4} = 1.0891$
- Type 1.05
 - $\sqrt{\sqrt{\sqrt{\dots}}}$ 12 times
 - -1
 - $\times 7, \div 4$
 - $+1$
 - $X=, X=, X= \dots 12$ times

9) Use of $\overset{\text{Memory+}}{\text{M+}}, \overset{\text{Memory-}}{\text{M-}}, \text{MRC}$ Memory Recall

Ex: $(8 \times 5) + (7 \times 3) + (6 \times 5) + (9 \times 3)$

$8 \times 5 = 40$ M+

$7 \times 3 = 21$ M+

$6 \times 5 = 30$ M+

$9 \times 3 = 27$ M+

MRC = 118

To clear Memory
press MRC 2 times.

Ex: $(7 \times 2) + (6 \times 2) + (7 \times 2) - (3 \times 2)$

$7 \times 2 = 14$ M+

$6 \times 2 = 12$ M+

$7 \times 2 = 14$ M+

$3 \times 2 = 6$ M-

MRC = 34

10) Trick for ratio

Eg: Divide ~~17455~~ in 8:7:3

Eg: 15000 should be divided among 3 persons in 2:3:5

- Total Ratio = $2+3+5=10$

- $\frac{15000}{10} = 1500$

- $1500 \times 2 = 3000$

- $3 = 4500$

- $5 = \frac{7500}{15000}$

11) Trick for finding %

Eg: 17240 should be divided in 10%, 25%, 30%, 12%

- $17240 \times 10\% = 1724$

- $25\% = 4310$

- $30\% = 5172$

- $12\% = 2068.8$

CALCULATOR TRICKS

SEQUENCES AND SERIES

To find $T_n = a + (n-1)d$ (A.P)

Calc $\Rightarrow (a+d) = \dots \dots \dots$ $(n+1)$

Ex: 2, 5, 8, $\dots$ T_{21}

$2+3 = \dots \dots \dots$ 23

$T_{21} = 62$

n+1

Sum of A.P series.

Ex: $S_3 = T_1 + T_2 + T_3$

$S_n = \frac{n}{2} [2a + (n-1)d]$

$S_n = \frac{n}{2} (a+l)$

Calc $\Rightarrow a+d = \dots \dots \dots$ $(n+1)$ GT $\oplus$ a

Ex: 2, 4, 6, 8, $\dots \dots \dots$ S_{10}

If a is -ve; +ve

GT - a GT + a

$S_{10} = 2+2 = \dots \dots \dots$ 11 GT + 2
 $= 110$

Ex: -2, -4, -6, -8, $\dots \dots \dots$ S_{10}

$S_{10} = -2-2 = \dots \dots \dots$ 11 GT - 2

A.M

A.M

$\frac{a+b}{2}$

Q: 55 & 43

$\frac{55+43}{2}$
 $= 49$

Insert

$\frac{b-a}{n+1}$

Q: 2 terms b/w 2 & 8.

$\frac{8-2}{2+1} = \frac{6}{3} = 2$

1st term = 2

$T_2 = 2+2 = 4$

$T_3 = 4+2 = 6$

$T_4 = 8$

To find $T_n = ar^{n-1}$ (G.P)

Calc $\Rightarrow r \times a = \dots \boxed{n+1}$

Eg: 2, 4, 8, 16, $\dots T_{10}$

$2 \times 2 = \dots \boxed{11}$

$T_{11} = 1024$

Eg: 3, 6, 12, $\dots T_{14}$

$r=2 \quad a=3$

$2 \times 3 = \dots \boxed{15}$

$T_{14} = 24576$

Sum of G.P series

$S_n = \frac{a(1-r^n)}{1-r}, r < 1$

$= \frac{a(r^n-1)}{r-1}, r > 1$

Calc $\Rightarrow r \times a = \dots \boxed{n+1}$ GT $\frac{+}{-} a$

Eg: 2, 4, 8, 16, $\dots S_8$

$S_8 = 2 \times 2 = \dots \boxed{9}$ GT + 2

$S_8 = 510$

$S_{\infty} = \frac{a}{1-r}$

Calc $\Rightarrow r \times a = \dots \boxed{0}$ GT $\frac{+}{-} a$

TIME VALUE OF MONEY

Simple Interest

- It is always calculated on Principal.
- Interest in S.I are always equal. (Int in 1st year = Int in 2nd year = ...)

$$S.I = \frac{PTR}{100}$$

$$\begin{aligned} A &= P + I \\ &= P + P \cdot i \cdot t \\ &= P(1 + i \cdot t) \end{aligned}$$

$$\begin{aligned} P &= A - I \\ I &= A - P \end{aligned}$$

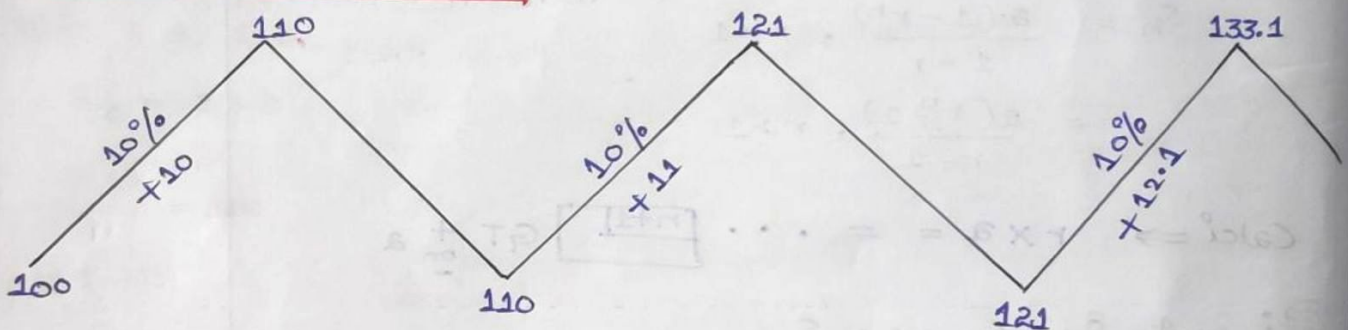
1 yr 3 months

$$1 + \frac{3}{12} = 1.25$$

1 yr 7 months

$$1 + \frac{7}{12} = 1.6$$

Compound Interest



- It is always calculated on Amount.
- In C.I we receive interest on interest i.e.,

Interest will always increase year by year.

$$A_n = P(1+i)^n$$

$$C.I = P[(1+i)^n - 1]$$

- If same P, T, R for both S.I & C.I then Interest for 1st year is equal i.e., S.I = C.I

Calci Trick

$$C.I = P + (r\% + r\% + \dots \text{T times} - P)$$

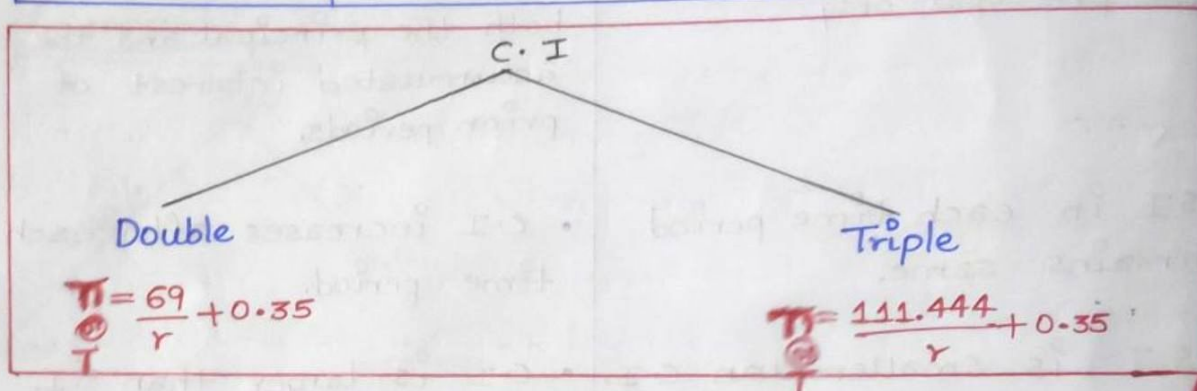
(years)

$$\text{Amount} = P + (r\% + r\% + r\% \dots \text{T times})$$

(years)

C.I at different conversion periods (Types of Compounding)

	Rate	Time
Yearly/Annually	$R \div 1$	$T \times 1$
Half Yearly/ Semi Annually	$R \div 2$	$T \times 2$
Quarterly	$R \div 4$	$T \times 4$
Monthly	$R \div 12$	$T \times 12$
Daily	$R \div 365$	$T \times 365$



Cases:-1

S.I

Eg: The sum of money doubles itself in 4 years, What would be (R)?

Ans: $A = 2P$

W.K.T $A - P = S.I.$

$2P - P = S.I$

$\frac{P}{100} = \frac{PTR}{100}$

$R = \frac{100}{4}$

$R = 25\%$

Calc Trick

$$R = \frac{n-1}{T} \times 100$$
No. of times i.e doubles or triples.

$R = \frac{2-1}{4} \times 100$

$R = 25\%$

Eg: A sum of money gets 7 times in 40 years.

$$R = \frac{n-1}{T} \times 100 = \frac{7-1}{40} \times 100$$

$R = 15\%$

Case - 2

Eg: If sum of money gets doubles in 6 years. In how many years it will get triple?

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

$$n_1 = 2 \quad n_2 = 3$$

$$T_1 = 6 \quad T_2 = ?$$

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

$$= 6 \left(\frac{3 - 1}{2 - 1} \right)$$

$$\frac{3 - 1}{2 - 1} \times 6$$

$$= 6 \times 2$$

$$= 12$$

∴ It triples in 12 years.

Case - 2

Eg: A sum of money doubles itself at C.I in 10 years in how many years will it become 8 times?

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

$$A = 8P$$

$$10 = 0.35 + \frac{69}{r}$$

$$r = 7.15\%$$

$$10 - 0.35 = \frac{69}{r}$$

$$r = \frac{69}{9.65} = 7.15\%$$

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

$$8P = P \left(1 + \frac{7.15}{100} \right)^T$$

$$8 = \left(\frac{100 + 7.15}{100} \right)^T$$

$$8 = \left(\frac{107.15}{100} \right)^T$$

$$8 = (1.0715)^T$$

Type in Calculator

1.0715 x (Till u get 8 or nearby value)

$$T = 30 \text{ yrs}$$

Case - 4:-

Eg: If a population of a village becomes 10250 after 2 years and 11070 after 3 years, what is the rate of increase per annum.

By O.V

- a) 5% b) 6% c) 7% d) 8%

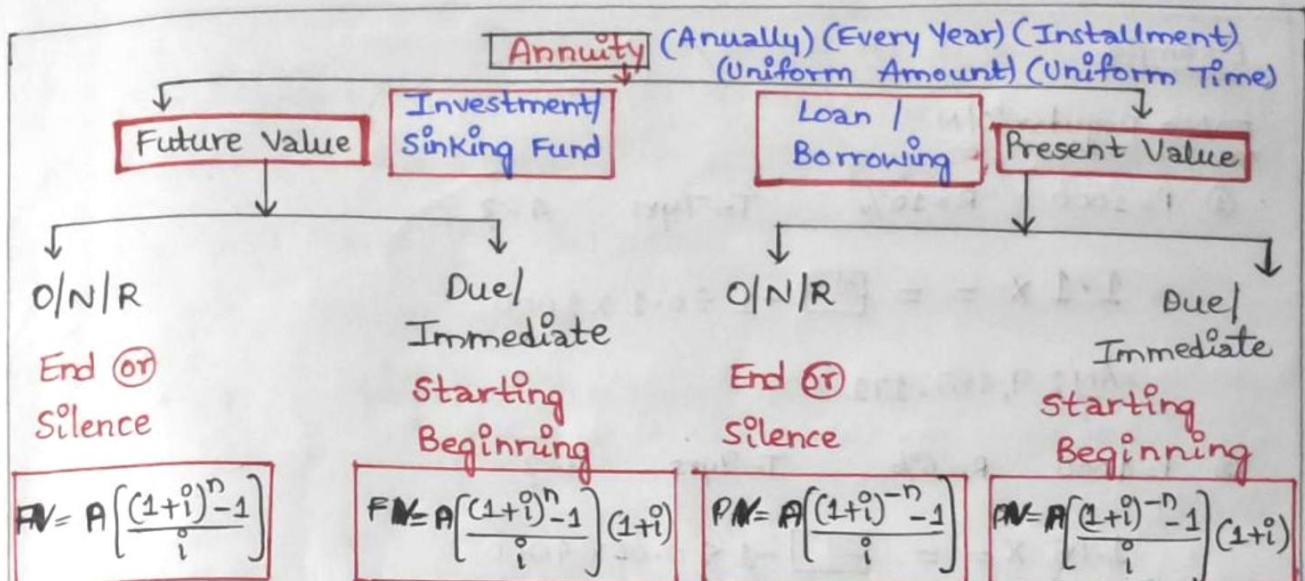
$$10250 + 8\% = 11070$$

When 10250 → 2 years

So Ans: 8%

11070 → 3 years (10250 + — % = 11070)

↓
While calculating this the Principal Amt is Amount of previous years.



CALCULATOR TRICKS

FUTURE VALUE

Annuity Regular / Ordinary / Normal

$$(1+i) \times = = \boxed{n+1} - 1 \div i \times A$$

Annuity Due / Immediate

$$(1+i) \times = = \boxed{n+1} - 1 \div i \times A \times (1+i)$$

PRESENT VALUE

Annuity Regular / Ordinary / Silence

$$(1+i) \div = = \boxed{n+2} \text{ GT } \times A$$

Annuity Due / Immediate

$$(1+i) \div = = \boxed{n+2} \text{ GT } \times A \times (1+i)$$

Note:-

1) GT is used only in PV.

2) In FV $\xrightarrow{\text{We go upto}}$ $\boxed{n+1}$

In PV $\xrightarrow{\text{We go upto}}$ $\boxed{n+2}$

~~If P is not known~~

If A is given, P to be found.

$$(1+i) \times = = \boxed{n+1} - 1 \div i = \text{Amount} = \rightarrow FV \rightarrow O/N/R$$

$$(1+i) \div = = \boxed{n+2} \text{ GT } \div = \text{Amount} = \rightarrow PV \rightarrow O/N/R$$

$(1+i) \times = = \boxed{n+1} \times \text{Cash flow}$ To Find Future Value	$(1+i) \div = = \boxed{n+2} \times A$ To Find Present Value
--	--

How to identify if question is of Annuity?

Use of words like

- Annuity
- Installment
- Each year/month/quarter

How to identify type of Annuity in question?

- If question is silent about when installments are starting or use of word at end of each period
- Annuity Regular
- Annuity Due is used when question is using words like
 - * starting today
 - * starting immediately
 - * starting Now.

How to identify que is of future value?

- Rs. 10,000 amounts to
- A sum of money will become
- You will receive Rs. 10,000 after 2 years
- The amount standing at your credit after

INVESTMENT
SINKING FUND

How to identify que is of Present value?

- Mr. A borrows Rs. 10,000
- What is loan amount

BORROWING
LOAN

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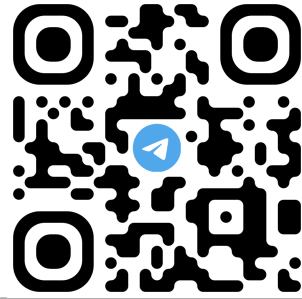
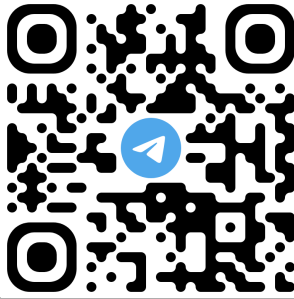
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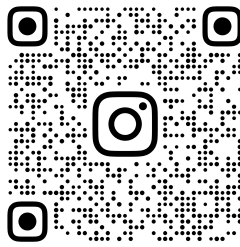
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