CALCUTATOR 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 × =) (No. × =)

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

$x^n \rightarrow$ $\boxed{n+1}$ $\boxed{5}$ 16

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

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

$\boxed{n+2}$ $\boxed{6.}$

(No. ÷ press (=) n times)

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

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

* Type 1.03.
* $\sqrt{\ }\sqrt{\ }\sqrt{\ }$..... 12 times
* −1
* × 7.2
* +1
* × =, × =, × = ... 12 times

- Type the given number.
- $\sqrt{\ }\sqrt{\ }\sqrt{\ }\sqrt{\ }$..... 12 times
- −1
- × Given power
- +1
- × =, × =, × =, ... 12 times

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

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

$(1.03)^{1/3} = 1.00990$

- Type (1.03)
- $\sqrt{}\sqrt{}\sqrt{}$... 12 times
- -1
- $\div 3$
- $+1$
- X=, X=, X= ... 12 times

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

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

$(1.05)^{7/4} = 1.0891$

- Type 1.05
- $\sqrt{}\sqrt{}\sqrt{}\sqrt{}$... 12 times
- -1
- $\times 7$, $\div 4$
- $+1$
- X =, X=, X=..... 12 times

9) Use of M+ (Memory+), M− (Memory −), MRC Memory Recall

Eg: $(8\times5)+(7\times3)+(6\times5)+(9\times3)$

$8\times5 = 40$ M+
$7\times3 = 21$ M+
$6\times5 = 30$ M+
$9\times3 = 27$ M+
MRC = 118

To clear Memory press MRC 2 times.

Eg: $(7\times2)+(6\times2)+(7\times2)-(3\times2)$

$7\times2 = 14$ M+
$6\times2 = 12$ M+
$7\times2 = 14$ M+
$3\times2 = 6$ 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 × 2 = 3000

(No need to press any button)

3 = 4500

~~5~~ = 7500

15000

11) Trick for finding %

Eg: 17240 ~~Should~~ be divided in 10%, 25%, 30%, 12%.

- 17240 × 10% 1724

(No need to press any button)

25% 4310

30% 5172

12% 2068.8

CALCULATOR TRICKS

SEQUENCES AND SERIES

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

Calci $\Longrightarrow$ $(a+d) = = \cdots \boxed{n+1}$ ~~times~~

Eg: 2, 5, 8, ... T_{21}

$2+3 = = \cdots \boxed{22}$ ~~times~~

$\boxed{T_{21} = 62}$

Sum of A.P series

Eg: $S_3 = T_1 + T_2 + T_3$

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

Calci $\Longrightarrow$ $a+d = = \cdots \boxed{n+1}$ GT $\pm$ a

Eg: 2, 4, 6, 8 ..... S_{10}

If a is −ve, +ve

GT−a $\quad$ GT+a

$S_{10} = 2+2 = = \boxed{11}$ GT+2

= 110

Eg: −2, −4, −6, −8, ... S_{10}

$S_{10} = -2-2 = = \boxed{11}$ GT−2

A.M

A.M $\quad\quad$ Insert

$\frac{a+b}{2}$ $\quad\quad$ $\frac{b-a}{n+1}$

Q: 55 & 43

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

= 49

Q: 2 terms b/w 2 & 8.

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

1st term = 2

$\boxed{T_2 = 2+2 = 4}$

$\boxed{T_3 = 4+2 = 6}$

$\boxed{T_4 = 8}$

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

calci $\Rightarrow$ $r \times a = = \cdots \boxed{n+1}$

Eg: 2, 4, 8, 16, ... T_{10}

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

$\boxed{T_{11} = 1024}$

Eg: 3, 6, 12 .... T_{14}

$r = 2 \quad a = 3$

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

$\boxed{T_{14} = 24576}$

Sum of G.P series

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

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

Calci $\Rightarrow$ $r \times a = = \cdots \boxed{n+1}$ GT $\pm$ a

Eg: 2, 4, 8, 16 .... S_8

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

$\boxed{S_8 = 510}$

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

Calci $\Rightarrow$ $r \times a = = \cdots \boxed{0}$ GT $\pm$ a

TIME VALUE OF MONEY

Simple Interest

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

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

$$\boxed{\begin{aligned} A &= P + I \\ &= P + Pit \\ &= P(1+it) \end{aligned}}$$

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

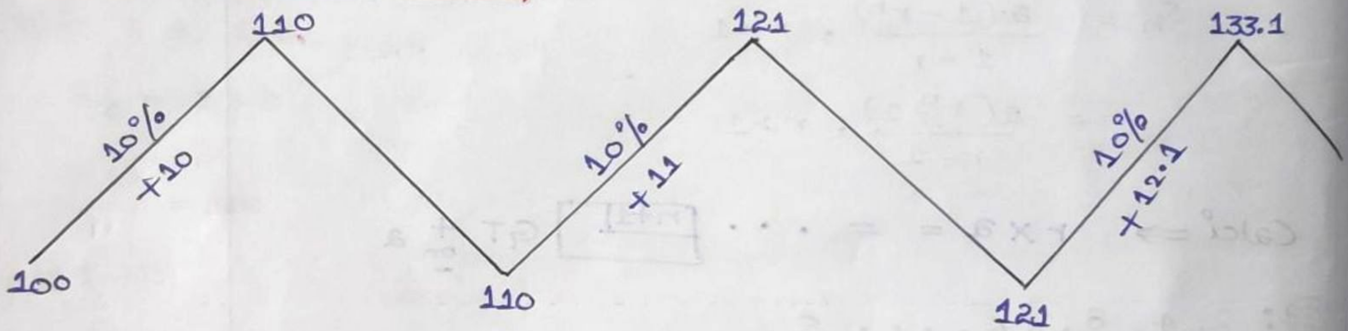
1 yr 3 months

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

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.

$$\boxed{\begin{aligned} A_n &= P(1+i)^n \\ C.I &= P\left[(1+i)^n - 1\right] \end{aligned}}$$

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

Calci Trick

C.I = P + (r% + r% + ... T times (years) − P)

Amount = P + (r% + r% + r% ... T times (years))

C.I at different conversion Periods (or) (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	$R \div 365$	$T \times 365$

C.I

Double

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

Triple

$$T = \frac{111.444}{r} + 0.35$$

Cases:-1

S.I

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

Ans: $A = 2P$.

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

$2P - P = S.I$

$\cancel{P} = \frac{\cancel{P}TR}{100}$

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

$\boxed{R = 25\%}$

Calci Trick

$$\underset{\text{Rate}}{R} = \frac{n-1}{\underset{\text{Time}}{T}} \times 100$$

No. of times i.e doubles or triples.

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

$\boxed{R = 25\%}$

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

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

$\boxed{R = 15\%}$

Case - 2

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

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

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

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

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

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

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

$$= 6 \times 2$$

$$= 12.$$

∴ 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?

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

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

$$\boxed{r = 7.15\%}$$

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

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

$$\boxed{A = 8P}$$

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

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

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

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

$$8 = (1.0715)^T$$

Type in Calculator

1.0715 × . . . . (Till u get 8 or nearby value)

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

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.

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

By O.V

10250 + 8% = 11070

So $\boxed{\text{Ans: } 8\%}$

~~when~~ 10250 ⟶ 2 years

11070 ⟶ 3 years (10250 + ___ % = 11070)

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

Annuity (Anually) (Every Year) (Installment) (Uniform Amount) (Uniform Time)

Future Value | **Investment/ Sinking Fund** | **Loan / Borrowing** | **Present Value**

Future Value

- O/N/R — End or Silence
  $$FV = A\left[\frac{(1+i)^n - 1}{i}\right]$$
- Due/ Immediate — Starting Beginning
  $$FV = A\left[\frac{(1+i)^n - 1}{i}\right](1+i)$$

Present Value

- O/N/R — End or Silence
  $$PV = A\left[\frac{(1+i)^{-n} - 1}{i}\right]$$
  or
  $$P\left[\frac{(1+i)^n - 1}{i(1+i)^n}\right]$$
- Due/ Immediate — Starting Beginning
  $$PV = A\left[\frac{(1+i)^{-n} - 1}{i}\right](1+i)$$

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

Annuity Due/ Immediate → $(1+i) \div == \boxed{n+2}\ GT \times A \times (1+i)$

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.

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

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

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