

II. AVERAGE

01) Three friends have 2, 7 and 3 idlies. Since they are close friends they decide to pool their idlies and share equally. How many idlies will each of them get?

☺ Pooled idlies: 12; Each gets: 4 idlies

02) A group of children pooled their 'gems' and the list was: 32, 17, 0, 23, 18, 39, 11.
 If they shared equally, how many did each get?

☺ Pooled gems:140 [Suggest Order of Adding: 32 & 18, 17 & 23, 39 & 11 = 50 + 40 + 50 = 140]
 Each gets:20 gems.

❖ What did we do in the above two cases?
 We divided the total into *equal shares*.

This *Equal Share* is called AVERAGE.

How to find it? *Divide the total into the required number of equal portions.*

$$\begin{aligned} \text{Average} &= \frac{\text{Pooled value}}{\text{Number of shares}} \\ &= \frac{\text{Total (of all numbers)}}{\text{Number of numbers}} \end{aligned}$$

AVERAGE - IMAGINARY VALUES

There are things like marks, weights, etc. that cannot be actually shared.
 We can still get an imaginary 'equal value(share)' which is the average.

04) What is the average mark of a group of students if each had scored 92, 85 and 96?

☺ Making 92+85+96 into 3 equal shares, average is 91.

AVERAGE - WHAT IT IMPLIES

What is the use or meaning of this 91 as average?

- ❖ No one got 91. But, we can roughly treat the three persons *as if each of them scored 91*.
- ❖ Note that *in either case the total marks are the same, 273*.

Equal Share in Different Practical Ways

☺ 92, 85, 96 This must be between 85 and 96.

Take 2 from 92 and 6 from 96; this leaves 90, 85, 90 and extra 8 on hand.

Give 5 to 85 from 8, make all 90, 90, 90; and the extra is 3.

Share this 3 among them you get 91, 91, 91

Average is 91. [This manipulation can be fast mentally; faster than explaining it.]

III. WHAT IS THE AVERAGE OF 2, 5, 8, ..., 38?

01) What is the average of (circle the average):

2	(5)	8					Average: _____
2	5	(8)	11	14			Average: _____
2	5	8	(11)	14	17	20	Average: _____

Do you see any pattern?

- Average is ☺. [Average increases by 1 term for every extra 2 terms on right]

02) Rearranging:

		2	(5)	8				Average: _____
		2	5	(8)	11	14		
	2	5	8	(11)	14	17	20	Average: _____

Do you see any pattern?

- ❖ Average is Middle term

03)	2	5	8	11	14	17	20	Average: 11
	2						20	Average: 11
		5				17		Average: 11
			8		14			Average: 11

- ❖ Average is Half of End terms
- ❖ Average is Half of symmetrically placed terms

04) Now what is the average of 2, 5, 8, ..., 38?

- ☺ Average is Half of 2 & 38 which is 20

05) What is the average of 2, 5, 8, ... to 15 terms?
 ☺ 15 terms means, 14 jumps; last term is $2 + 42 = 44$
 Average is Half of 2 & 44 which is 23

06) In the above which term is the average?
 ☺ 15 terms means, middle term is half of $1 + 15 = 8$; Eighth term.

07) What is the 8th term?
 ☺ 8th term is $2 + 21 = 23$

NATURAL NUMBERS

08) What is the average of 1, 2, 3, ..., 9?

- ☺ Average = half of end numbers = half of $(9 + 1)$
- ❖ You could also say this as: Average is **half of next number**