

## Average

Consecutive Number (Successive Numbers)

$$x, x+1, x+2, x+3$$

Consecutive odd Numbers  
 centre No is Avg

Put  $x, x+2, x+4, x+6$

$$x-1, 1, 3, 5, 7$$

Consecutive Even Numbers

$$x, x+2, x+4, x+6$$

Put

$$x-4, 4, 6, 8, 10$$

$$\text{Avg} = \frac{\text{Sum of Observation}}{\text{Total No of Observation}}$$

Eg -

$$1. 1, 3, 5, 7, 9$$

$$2. 26, 28, 30, 32, 34$$

$$3. 96, 97, 98, 99, 100$$

$$4. 101, 102, 103, 104$$

$$5. 52, 54, 56, 58$$

- Q1. The Average age of A, B and C is 26 years, if the Average age of A and C is 29 years, what is the age of B in years

$$\frac{A+B+C}{3} = 26$$

$$A+B+C = 26 \times 3 = 78 \rightarrow \textcircled{1}$$

$$\frac{A+C}{2} = 29$$

$$A+C = 29 \times 2 = 58 \rightarrow \textcircled{2}$$

Equ ① - equ ②

$$A+B+C - A-C = 78 - 58$$

$$B = 20 \text{ years}$$



Q2 The average of 7 numbers is 5. If the average of first six of these numbers is 4, the seventh number is ?

$$\frac{\text{Total}}{\text{Avg (1-7)}} = 5$$

$$\text{Total 7} = 35 \rightarrow \textcircled{1}$$

$$\text{First 6 No} = 4 \times 6 = 24 \rightarrow \textcircled{2}$$

$$\textcircled{1} - \textcircled{2}$$

$$= 35 - 24 = \textcircled{11} \quad \therefore 7^{\text{th}} \text{ No is } 11$$

Q3 The average of number 10 numbers is 7. What will be the new average if each of the numbers is multiplied by 8?

$$10^{\text{th}} \text{ No's Average} = 7$$

$$10 \text{ No's Total} = 10 \times 7 = 70$$

Each No, Multiplied by 8

$$= 70 \times 8 = 560$$

$$\therefore \text{New Average} = \frac{560}{10}$$

$$= 56$$



Q1 The Average of 5 Consecutive Even Numbers starting with 4 is

$$\underline{4} \quad \underline{6} \quad \underline{8} \quad \underline{10} \quad \underline{12}$$

$$\text{Avg} = 8$$

Q5 A, B, C and D are four Consecutive Even Numbers respectively and their average is 65 What is the Product of A & D

$$\begin{array}{cccc} A & B & | & C & D \\ 62 & 64 & & 66 & 68 \\ & & \downarrow & & \\ & & 65 & & \end{array}$$

$$\text{Pdt of A \& D} = 62 \times 68 = 4216$$

Q6 A, B, C and D are 4 Consecutive odd numbers and their average is 42 What is the Product of B and D

$$\begin{array}{cccc} A & B & | & C & D \\ 39 & 41 & & 43 & 45 \\ & & \downarrow & & \\ & & 42 & & \end{array}$$

$$\text{Pdt of B \& D} = 41 \times 45 = 1845$$

Q7 of the three numbers. The first is twice the second and second is three the third. If the average of 3 numbers is 10. The numbers are



$$\text{Third} = x$$

$$\text{Second} = 3x$$

$$\text{First} = 2(3x) = 6x$$

$$\frac{6x + 3x + x}{3} = 10$$

$$6x + 3x + x = 30$$

$$10x = 30$$

$$x = 3$$

The Numbers are  $6 \times 3$ ,  $3 \times 3$ ,  $3 = 18, 9, 3$

Qs The sum of five numbers is 555. The Average of the first two numbers is 75 and the third number is 115. What is the average of the last two numbers?

$$a + b + c + d + e = 555$$

$$\frac{a + b}{2} = 75$$

$$a + b = 75 \times 2 = 150$$

$$c = 115$$

$$150 + 115 + d + e = 555$$

$$d + e = 555 - 265$$

$$d + e = 290$$

$$\text{Avg of last two Numbers} = \frac{290}{2} = 145$$



Q9 The Average Expenditure of a man for the first five months is Rs 3600 and for next seven months it is Rs 3900, if he saves Rs 8700 during the year, his average income per month is ?

$$\begin{aligned} \text{Avg Expenditure for first 5 Months} &= \text{Rs } 3600 \\ 5 \text{ Month Expenditure} &= \text{Rs } 3600 \times 5 \end{aligned}$$

$$= \text{Rs } 18,000$$

For Next 7 Months.

$$= 3900 \times 7 = 27,300$$

$$\text{Saving} = 8700$$

$$\text{Total Income} = 18000 + 27300 + 8700$$

$$\text{Annum} = 54000$$

$$\text{Income Per Month} = \frac{54000}{12} = 4500$$

$$\text{Avg Monthly Income} = \text{Rs } 4500$$

Q10 The sum of three numbers is 98. If the ratio between first and second be 2:3 and between second and third be 5:8, then the second number is

$$a + b + c = 98$$

$$a : b = 2 : 3$$

$$b : c = 5 : 8$$



$$\frac{a}{b} = \frac{2}{3} \quad \Bigg| \quad \frac{b}{c} = \frac{5}{8}$$
$$a = \frac{2b}{3} \quad \Bigg| \quad c = \frac{8b}{5}$$

$$\frac{2b}{3} + b + \frac{8b}{5} = 98$$

$$\frac{10b + 15b + 24b}{15} = 98$$

$$49b = 98 \times 15$$

$$49b = 98 \times 15$$

$$b = \frac{98 \times 15}{49}$$

$$b = 30$$

The second number is 30

(00)

$$a + b + c = 98$$

$$a : b = 2 : 3 \quad \& \quad b : c = 5 : 8$$

$$a : b : c = 2 : 3 : 5 : 8$$

$$= 10 : 15 : 24$$

$$10x + 15x + 24x = 98$$

$$49x = 98$$

$$x = 2$$

$$\text{Second No.} = x \times 15 = 2 \times 15 = 30$$

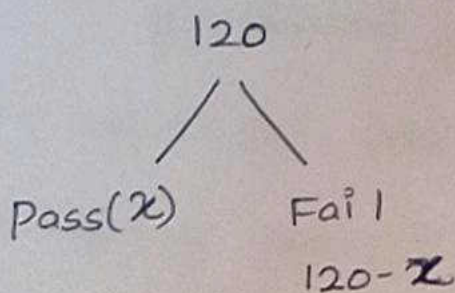


Q11 The Average of marks obtained by 120 candidates was 35. If the average of marks of Passed Candidate was 39, and the failed candidate was 15, the number of candidates who passed the examination is.

Total Marks of 120

$$\text{Candidates} = 120 \times 35$$

$$= 4200$$



$$4200 = x \times 39 + (120 - x) \times 15$$

$$4200 = x \times 39 + 1800 - 15x$$

$$4200 = 39x - 15x + 1800$$

$$2400 = 24x$$

$$x = \frac{2400}{24} = 100$$

No of Candidate are Passed = 100

Q12 In a school, the average age of students is 6 years and the average age of 12 teachers is 40 years. If the average age of the combined group of all the teachers and the students is 7 years, then the number of students is.

Teachers + Students

$$(12 + x) \times 7 = (x \times 6) + 12 \times 40$$

Total school age = student age + teachers age

$$84 + 7x = 6x + 480$$

$$x = 396$$

Total No of Students = 396



Q13 The Average Monthly salary of all the Employees in an industry is Rs 12000. The Average salary of male Employee is Rs 15000 and that of female Employee is Rs 8000. What is the ratio of male Employees to female Employee?

$$\text{Male} = x ; \text{Female} = y$$

$$(x+y) \times 12000 = x \times 15000 + 8000 \times y$$

$$12000x + 12000y = 15000x + 8000y$$

$$12x + 12y = 15x + 8y$$

$$12y - 8y = 15x - 12x$$

$$4y = 3x$$

$$\frac{x}{y} = \frac{4}{3}$$

$$\therefore \text{Ratio} = 4 : 3$$

Q14 In a school with 600 students, the average age of the boys is 12 years and that of the girls is 11 years. If the average age of the school is 11 years and 9 months, then the number of girls in the school is

$$\begin{array}{c} 600 \\ \swarrow \searrow \\ \text{Boys } (x) \quad (600-x) \text{ girls} \end{array}$$



$$600 \times 11 \frac{9}{12} = x \times 12 + (600 - x) \times 11$$

$$600 \times 11 \frac{9}{12} = 12x + 6600 - 11x$$

$$150 \times \frac{47}{4} = x + 6600$$

$$7050 = x + 6600$$

$$x = 7050 - 6600$$

$$x = 450$$

$$\text{No of girls} = 600 - 450 = 150 \text{ girls}$$

$$\text{No of Boys} = 600$$

Q15 The average salary of all the staff in an office of a Corporate house is RS 5000. The average salary of the officers is RS 14000 and that of the rest is RS 4000 If the number of staff is 500, the number of officers?

$$500 \times 5000 = x \times 14000 + (500 - x) \times 4000$$

$\begin{array}{l} 500 \\ \swarrow \quad \searrow \\ \text{Officers} \quad \text{rest} \\ x \quad 500-x \end{array}$

$$2500000 = 14000x + 2000000 - 4000x$$

$$2500 = 14x + 2000 - 4x$$

$$10x = 500$$

$$x = 50$$

$$\text{No of officers} = 50$$

$$\text{Rest} = 500 - 50 = 450$$



Q1 The mean of the marks obtained by 100 students is 60. If the marks obtained by one of the students was incorrectly calculated as 75, whereas the actual marks obtained by him was 65, what is the correct mean of the marks obtained by the students?

$$100 \times 60 = 6000 \text{ (School total Marks)}$$

$$\begin{array}{r} \text{Actual Marks} - 65 \\ \text{Incorrect Marks} - 75 \end{array} \left. \vphantom{\begin{array}{r} \text{Actual Marks} - 65 \\ \text{Incorrect Marks} - 75 \end{array}} \right\} -10 \text{ Marks}$$

$$= 6000 - 10 = 5990$$

$$\text{Correct Mean} = \frac{5990}{100} = 59.9$$

Avg Mark

Q2 A Mathematics teacher tabulated the marks secured by 35 students of 8<sup>th</sup> class. The Average of their marks was 72. If the marks secured by Reema was written as 36 instead of 86 then find the correct Avg marks up to two decimal places

Reema

$$\begin{array}{r} \text{Actual} - 86 \\ \text{Written} - 36 \end{array} \left. \vphantom{\begin{array}{r} \text{Actual} - 86 \\ \text{Written} - 36 \end{array}} \right\} 50$$

Class Total Marks

$$35 \times 72 = 2520$$

$$= 2520 + 50$$

$$= 2570$$

$$\text{New Avg} = \frac{2570}{35} = \frac{73.43}{7}$$



Q3 The Avg of marks of 14 students was calculated as 71. But, it was later found that the marks of one student had been wrongly entered as 42 instead of 56 and of another as 74 instead of 30. The correct Average is

$$14 \times 71 = 994$$

Student total  
Marks = 994

$$\begin{array}{r} \text{C } 56 \\ \text{E } 42 \end{array} \left. \vphantom{\begin{array}{r} \text{C } 56 \\ \text{E } 42 \end{array}} \right) +14 \quad \begin{array}{r} \text{C } 32 \\ \text{E } 74 \end{array} \left. \vphantom{\begin{array}{r} \text{C } 32 \\ \text{E } 74 \end{array}} \right) -42 = 994 + 14 - 42$$

Total Student = 994 + 14 - 42  
Marks = 966

$$\text{Correct Avg} = \frac{966}{14} = 69$$

Q4 The Average marks in science subject of a class of 20 students is 68. If the marks of two students were misread as 48 and 65 of the actual marks 72 and 61, respectively, then what would be the correct average?

$$20 \times 68 = 1360$$

A H

$$\begin{array}{r} \text{E H } 72 \\ +24 \\ 48 \end{array} \quad \begin{array}{r} 61 \\ -4 \\ 65 \end{array}$$

$$\begin{aligned} \text{Total Marks} &= 1360 + 24 - 4 \\ &= 1360 + 20 \\ &= 1380 \end{aligned}$$

$$\text{New Avg} = \frac{1380}{20} = 69$$



Q5 The Average Marks in English Subject of a class of 24 students is 56. If the Marks of three students were misread as 44, 45 and 61 of the actual marks 48, 59 and 67, respectively, then what would be correct Average.

$$\begin{aligned} \text{Total English Marks} &= 24 \times 56 \\ &= 1344 \end{aligned}$$

A.M

$$\begin{array}{r} 48 \quad 59 \quad 67 \\ +4 \quad | \quad | +14 \quad | +6 \\ \hline 44 \quad 45 \quad 61 \end{array}$$

$$\begin{aligned} \text{Total} &= 1344 + 4 + 14 + 6 \\ &= 1344 + 24 \\ &= 1368 \end{aligned}$$

$$\text{New Avg} = \frac{1368}{24} = 57$$

Replacing a Person

Q6 The Avg age of a Committee of 8 members is 40 yrs. A member, aged 55 yrs, retired and he was replaced by a member aged 39 yrs. The average age of the Present Committee is

$$\begin{aligned} \text{Total age} &= 8 \times 40 \\ \text{of 8 Member} &= 320 \end{aligned}$$

$$= \frac{320 - 55 + 39}{8}$$

$$= \frac{320 - 16}{8} = \frac{304}{8} = 38$$

Avg age of Present Committee is 38 yrs



Q7 The Average weight of three men A, B, C is 84 kg. Another man, D, joins the group, and the Avg weight becomes 80 kg. If another man, E, whose weight is 3 kg more than that of D, replaces A, then Average weight of B, C, D and E becomes 79 kg. The weight of A is .

$$\frac{A+B+C}{3} = 84 \text{ kg}$$

$$A+B+C = 84 \times 3 = 252 \text{ kg} \rightarrow \textcircled{1}$$

$$\frac{A+B+C+D}{4} = 80 \text{ kg}$$

$$A+B+C+D = 320 \text{ kg} \rightarrow \textcircled{2}$$

Equ.  $\textcircled{2} - \textcircled{1}$

$$D = 68 \text{ kg}$$

$$E = 68 + 3 = 71 \text{ kg}$$

$$\frac{B+C+D+E}{4} = 79$$

$$B+C+D+E = 316 \text{ kg}$$

$$B+C = 316 - 68 - 71$$

$$B+C = 316 - 139$$

$$B+C = 177 \rightarrow \textcircled{3}$$

Sub  $\textcircled{3}$  in  $\textcircled{1}$

$$A + 177 = 252$$

$$A = 252 - 177$$

$$A = 75 \text{ kg}$$



Including &  
excluding

Q8 The Avg weight of 21 boys was recorded as 64 kg. If the weight of the teacher was added the average increased by one kg. What was the teacher's weight?

Total Weight of

$$\text{boys} = 64 \times 21$$

$$= 1344$$

Total Weight of

$$\text{Boys \& teacher} = 65 \times 22$$

$$= 1430$$

$$1344 \sim 1430$$

$$\text{The Difference} = 86 \text{ kg.}$$

Q9 The Avg age of 14 girls and their teacher age is 15 yrs. If the teacher's age is excluded then the average reduced by 1. What is the teacher's age?

$$\text{Avg Age of} = 15 \times 15$$

both girls +  
teacher

?

$$\text{Avg of girls} = 14 \times 14$$

$$225 \sim 196 = 29$$

∴ The teacher age is 29 yrs

Q10 The Avg age of 5 members of a family is 25yo. If the servant of the family is included the avg age is increased by 40%. What is the age of servant?

Family +servant

$$5 \times 25 \sim 6 \times 35$$

$$125 \sim 210 = 85$$

servant age = 85yos

$$25 + 25 \times \frac{40}{100}$$

$$25 + 10$$

Q11 The Avg age of 4 members of a family is 25yos. If head of the family is excluded in this group then Avg age is increased by 20%. Find out the age of head.

~~head~~ + family excluded head family

$$25 \times 4 \sim 5 \times 30$$

$$100 \sim 150 = 50$$

∴ Age of head = 50yos

$$25 + 25 \times \frac{20}{100}$$

$$= 30$$

Q12 The Avg age of a class is 35yo. 6 new students with an Avg age of 33yo joined in that class, there by decreasing the Avg by half year. The original strength of the class was?

$$\frac{x \times 35 + 6 \times 33}{x + 6} = 35 - \frac{1}{2}$$

$$\frac{35x + 198}{x + 6} = 35 - 0.5 = 34.5$$

$$35x + 198 = (x + 6) 34.5$$

$$35x + 198 = 34.5x + 207$$

$$0.5x = 9$$

$$x = \frac{9 \times 2}{1} = 18$$