AVERAGE

Ex.1:Find the average of all prime numbers between 30 and 50?
Sol: there are five prime numbers between 30 and 50.
They are 31,37,41,43 and 47.
Therefore the required average=(31+37+41+43+47)/5 ⇔199/5 ⇔ 39.8.

Ex.2. find the average of first 40 natural numbers?
Sol:sum of first n natural numbers=n(n+1)/2;
So,sum of 40 natural numbers=(40*41)/2 ⇔820.
Therefore the required average=(820/40) ⇔20.5.

Ex.3. find the average of first 20 multiples of 7?
Sol: Required average =7(1+2+3+…….+20)/20 ⇔(7*20*21)/(20*2) ⇔(147/2)=73.5.

Ex.4. the average of four consecutive even numbers is 27. find the largest of thesenumbers?
Sol: let the numbers be x,x+2,x+4 andx+6. then,
(x+(x+2)+(x+4)+(x+6))/4) = 27
⇔(4x+12)/4 = 27
⇔x+3=27 ⇔ x=24.
Therefore the largest number=(x+6)=24+6=30.

Ex.5. there are two sections A and B of a class consisting of 36 and 44 students respectively. If the average weight of section A is 40kg and that of section B is 35kg, find the average weight of the whole class?
Sol: total weight of(36+44) students=(36*40+44*35)kg =2980kg.
Therefore weight of the total class=(2980/80)kg =37.25kg.

Ex:6.nine persons went to a hotel for taking their meals 8 of them spent Rs.12 each on their meals and the ninth spent Rs.8 more than the average expenditure of all the nine.What was the total money spent by them?
Sol: Let the average expenditure of all nine be Rs.x
Then 12*8+(x+8)=9x or 8x=104 or x=13.
Total money spent = 9x=Rs.(9*13)=Rs.117.

Ex.7: Of the three numbers, second is twice the first and is also thrice the third.If the average of the three numbers is 44.Find the largest number.
Sol: Let the third number be x.
Then second number = 3x.
First number=3x/2.
Therefore x+3x+(3x/2)=(44*3) or x=24
So largest number= 2nd number=3x=72.

Ex.8:The average of 25 result is 18.The average of 1st 12 of them is 14 & that of last 12 is 17.Find the 13th result.
Sol: Clearly 13th result=(sum of 25 results)-(sum of 24 results)
=(18*25)-(14*12)+(17*12)
=450-(168+204)
=450-372
=78.

Ex.9:The Average of 11 results is 16, if the average of the 1st 6 results is 58 & that of the last 63. Find the 6th result.
Sol: 6th result = (58*6+63*6-60*11)=66

Ex.10:The average waight of A,B,C is 45 Kg. The avgwgt of A & B be 40Kg & that of B,C be 43Kg. Find the wgt of B.
Sol. Let A,B,c represent their individual wgts.
Then,
A+B+C=(45*3)Kg=135Kg
A+B=(40*2)Kg=80Kg & B+C=(43*2)Kg=86Kg
B=(A+B)+(B+C)-(A+B+C)
=(80+86-135)Kg
=31Kg.

Ex. 11. The average age of a class of 39 students is 15 years. If the age of the teacher be

included, then the average increases by3 months. Find the age of the teacher.

Sol. Total age of 39 persons = (39 x 15) years
= 585 years.
Average age of 40 persons= 15 yrs 3 months
= 61/4 years.
Total age of 40 persons = $\left(\frac{61}{4}\right)$x 40) years= 610 years.

:. Age of the teacher = (610 - 585) years=25 years.

Ex. 12. The average weight of 10 oarsmen in a boat is increased by 1.8 kg when one of the crew, who weighs 53 kg is replaced by a new man. Find the weight of the new man.
Sol. Total weight increased =(1.8 x 10) kg =18 kg.
:. Weight of the new man =(53 + 18) kg =71 kg.

Ex. 13. There were 35 students in a hostel. Due to the admission of 7 new students, ;he expenses of the mess were increased by Rs. 42 per day while the average expenditure per head diminished by Rs 1. Wbat was the original expenditure of the mess?
Sol. Let the original average expenditure be Rs. x. Then,
42 (x - 1) - $35x$=42 $\Leftrightarrow$ $7x$= 84 $\Leftrightarrow$ x =12.
Original expenditure = Rs. (35 x 12) =Rs. 420. .

14. A batsman makes a score of 87 runs in the 17th inning and thus increases his avg by 3. Find his average after 17th inning.

Sol. Let the average after 17th inning = x.

Then, average after 16th inning = $(x - 3)$.

∴ $16 (x - 3) + 87 = 17x$ or $x = (87 - 48) = 39$.

Ex.15. Distance between two stations A and B is 778 km. A train covers the journey from A to B at 84 km per hour and returns back to A with a uniform speed of 56 km perhour. Find the average speed of the train during the whole journey.

Sol. Required average speed = ((2xy)/(x+y)) km / hr

=(2 x 84 x 56)/(84+56)km/hr

= (2*84*56)/140 km/hr

=67.2 km/hr.