2 Ages

Basics of average :-

Note: understand → create eqn → solve

1) Ram is 3 times old as Sam - 2 years ago he was 5 times old as Sam. What is present age of Ram?

Soln. Present → Ram age = $3x$

Sam age = x

2 years ago → Ram age = $3x-2$

Sam = $x-2$

but also 2 years back Ram 5x of Sam

$3x-2 = 5(x-2)$

$3x-2 = 5x-10$

$2x = 8$

$\boxed{x=4}$ → Sam age

Ram present → $3x$

$= 3\times4 = \boxed{12 \text{ years}}$

2) 12 years ago, age of P was 3x age of Q. After 12 years, ratio of ages of Q to P will 2:3. What is present age of P?

Soln:

-12 years	⟷	Present	→	+12 years
$(P-12)$		P		$(P+12)$
$(Q-12)$		Q		$(Q+12)$

$(P-12) = 3(Q-12)$

$P = 3Q-36-12$

$\boxed{P = 3Q-24}$ ④①

$\frac{Q+12}{P+12} = \frac{2}{3}$

$\frac{Q+12}{3Q-24+12} = \frac{2}{3}$

$$\frac{Q+12}{3Q-12} = \frac{2}{5} \Rightarrow 3Q+36 = 6Q-24$$

$$\Rightarrow 3Q = 60$$

$$\boxed{Q = 20 \text{ years}}$$

from ① $\Rightarrow P = 3Q-24$

$$= 60-24$$

$$\boxed{P = 36 \text{ years}}$$

3) Rohan is as much younger than Ajay as he is older than Meena. The sum of ages of Ajay and Meena is 108 years. How old is Rohan?

Soln: Given:- Meena < Rohan < Ajay

Ajay + Meena age = 108 //

(age diff) = (diff ages)

That is Rohan is average of both Meenan and Ajay age

$$\text{Avg} = \frac{\text{Sum}}{\text{Total}} = \text{R}$$

$$\Rightarrow \text{Rohan's age} = \frac{\text{Meena age} + \text{Ajay age}}{2}$$

$$= \frac{108}{2}$$

$$\boxed{\text{Rohan} = 54 \text{ years}}$$

4) Rohan's age is 5x Ajay's and seven eighteenth of Meena's age. The sum of the ages of all three of them is 132 years. How much younger is Ajay to Meena?

Soln: Let Ajay age be A

Rohan age = 5(A)

also $= \frac{7}{18}(M)$ also can be said $M = \frac{18}{7}(A)$

$M = \frac{18(5A)}{7} \Rightarrow \frac{90A}{7}$ //

Ajay, Rohan, meen

Also given: $A + 5A + \frac{90A}{7} = 132$

$$\frac{6A + 90A}{7} = 132 \Rightarrow 42A + 90A = 132 \times 7$$

$$\Rightarrow 132A = 132 \times 7 \rightarrow A = 7 \text{ years}$$

Rohan $\rightarrow 5A \rightarrow 35$ years

Meena $= \frac{90A}{7} \Rightarrow \frac{90(7)}{7} \Rightarrow 90$ years

How younger ajay is to Meena $= 90 - 7$

$= 83$ years //

5) Ram and Shyam's avg age is 65 years. The average age of Ram, Shyam and John is 53 years. What is age of John?

Solⁿ: Avg of Ram shyam $= \frac{Ram + Shyam}{2}$

$$65 = \frac{R+S}{2}$$

$$R + S = 130 \quad \text{--- (1)}$$

Avg of Ram, Shyam, John $= \frac{R+S+J}{3}$

$$53 \times 3 = R + S + J$$

$$R + S + J = 159$$

from (1)

$$130 + J = 159$$

$$J = 29 \text{ years}$$

6) The average age of 10 students and their teacher is 15 years. The average age of the first 7 students is 15 years and that of last 3 is 11 years. What is teacher's age?

Sol:- Avg of 10 stud + 1 teacher = $\frac{S_{10}+T}{11}$

$$15 = \frac{S_{10}+T}{11}$$

$$S_{10}+T = 165$$

Avg of 7 stud = $\frac{S_7}{7} \Rightarrow 15 = \frac{S_7}{7}$

Sum of 7 stud age = 105 $\rightarrow (15 \times 7)$

Similarly Sum of 3 stud age = 33 $\rightarrow (11 \times 3)$

Total Sum of students age = 105 + 33

$$S_{10} = 138$$

$$S_{10}+T = 165$$

$$138 + T = 165$$

$$T = 27 \text{ years}$$

7) The average age of a group of 4 friends is 36 years. The youngest friend amongst them is 6 years old. What was the average age of group at time of the birth of youngest friend?

$$\text{Avg}_4 = 36 = \frac{S_4}{4} \Rightarrow S_4 = 144$$

6 years ago → everybody age − 6 so ⇒ 4 × −6 ⇒ −24

and also at birth → age not considered bcs 0

So Avg of 3 before 6 years (birth) ⇒ $S_3 = \frac{144-24}{3} \Rightarrow \frac{120}{3} = 40$ years //

8) Average age of a family of 4 members was 19 years, 4 years back. Birth of a new child kept the avg age of family same even today. How old is the child today?

$$\text{Avg}_4 = 19 = \frac{S_4}{4}$$

$$S_4 = 76 \text{ years}$$

after 4 years it should +4×4 months (16)

So $S_4 = 92$ years.

Now present (one child birth) Avg of 5 members = same = 19.

$$S_5 = \frac{\text{Tot}}{\text{No}} \Rightarrow 19 = \frac{S_4(\text{present}) + \text{child age}}{5}$$

$$19 = \frac{92 + \text{child}}{5} \Rightarrow 95 - 92$$

Child age = 3 years