Problems on Ages Quick Maths Formulas

Formulas –

- ✓ If the current age is x, then n times the age is nx.
- ✓ If the current age is x, then age n years later/hence = x + n.
- ✓ If the current age is x, then age n years ago = x - n.
- ✓ The ages in a ratio a : b will be ax and bx.
- ✓ If the current age is x, then 1/n times the age is x/n.

Quicker Methods –

To find out son's age, use this formula –

1. If t_1 years earlier the father's age was x times that of his son. At present the father's age is y times that of his son. Then the present age of son will be?

Son's Age = t_1 (x-1) / (x-y)

2. If present age of the father is y times the age of his son. After t_2 years the father's age become z times the age of his son. Then the present age of son will be?

Son's Age = $(z-1)t_1 / (y-z)$

3. t_1 years earlier, the age of the father was x times the age of his son. After t_2 years, the father's age becomes x times the age of his son. Then the present age of son will be?

Son's Age = $[(z-1)t_2 + (x-1)t_1] / (x-z)$

4. **Son's or Daughter's Age = [Total ages + No. of years ago (Times - 1)] / (Times+1)**

5. **Son's or Daughter's Age = [Total ages - No. of years ago (Times - 1)] / (Times+1)**

6. Father : Son

   Present Age = x : y

T years before = a : b

Then, **Son's age = y * [T(a-b) / Difference of cross product]**
And **Father's age = x * [T(a-b) / Difference of cross product]**

Problem on Trains Quick Maths Formulas

1. When x and y trains are moving in opposite direction, then their **relative speed = Speed of x + Speed of y**

2. When x and y trains are moving in same direction, then their **relative speed = Speed of x - Speed of y**

3. When a train passes a platform, it should travel the length equal to **the sum of the lengths of train & platform both**.

4. Distance = (Difference in Distance) * [(Sum of Speed) / (Diff in Speed)]

5. Length of Train = [(Length of Platform) / (Difference in Time)] * (Time taken to cross a stationary pole or man)

6. Speed of faster train = (Average length of two trains) * [(1/Opposite Direction's Time) + (1/Same Direction's Time)]

7. Speed of slower train = (Average length of two trains) * [(1/Opposite Direction's Time) - (1/Same Direction's Time)]

8. Length of the train = [(Difference in Speed of two men) * T1 * T2)] / (T2-T1)

9. Length of the train = [(Difference in Speed) * T1 * T2)] / (T1-T2)

10. Length of the train = [(Time to pass a pole) * (Length of the platform)] / (Diff in time to cross a pole and platform)

11. First train's starting point = S1 * [{(Total Distance) – S2 * (T1-T2)} / (S1+S2)]

12. S2 = S1 * Square root of [(Time taken by first train after meeting) / (time taken by second train after meeting)]

Boats and Streams Quick Maths Formulas

1. If the speed of the boat is x and if the speed of the stream is y while upstream then the effective speed of the boat is = x - y

2. And if downstream then the speed of the boat = x + y

3. If x km/hr be the man's rate in still water and y km/hr is the rate of the current. Then

   Man's rate with current = x + y
   Man's rate against current = x – y

4. A man can row x km/hr in still water. If in a stream which is flowing at y km/hr, it takes him z hrs to row to a place and back, the distance between the two places is = $z * (x^2 – y^2) / 2x$

5. A man rows a certain distance downstream in x hours and returns the same distance in y hours. If the stream flows at the rate of z km/hr, then the speed of the man in still water is given by – z* (x + y) / (y - x) km/hr.

6. Man's rate against current = Man's rate with current – 2 * rate of current

7. Distance = Total Time * [(Speed in still water)^2 – (Speed of current)^2] / 2 * (Speed in still water)

8. Speed in Still Water = [(Rate of Stream) * (Sum of upstream and downstream time)] / (Diff of upstream and downstream time)