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## Ages

### Formulas:

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

### Solved Problems:

**1. The sum of the present ages of two persons C and D is 45. If the age of C is twice that of D, find the sum of their ages 5 years hence?**

**Answer:** 55 years

#### Explanation:

Given data, the present ages of  $C + D = 45$  and

$$C = 2 * D$$

To find, sum of their ages after 5 years

$$C + D = 45$$

$$2D + D = 45$$

$$3D = 45$$

$$D = 15$$

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Then,  $C + D = 45$

$$C + 15 = 45$$

$$C = 45 - 15$$

$$C = 30$$

The present ages of C and D are 30 and 15 years

After 5 years, their ages are 35 ( $30 + 5$ ) and 20 ( $15 + 5$ ) years

The Sum of their ages after 5 years =  $35 + 20$

$$= 55 \text{ years}$$

† The Sum of their ages after 5 years is 55 years.

**2. A man said to his son, "I was two-third of your present age when you were born". If the present age of the man is 50 years, find the present age of the son?**

**Answer:** 30 years

**Explanation:**

Let the Present age of the son be P and

The age of the man was  $(50 - P)$  [ when son was born]

Given, Man's age when the son was born is  $\frac{2}{3}$  of P

$$(50 - P) = \frac{2}{3} P$$

$$3 * (50 - P) = 2 P$$

$$3 * 50 - 3p = 2p$$

$$150 = 2p + 3p$$

$$150 = 5p$$

$$p = 150 / 5$$

$$= 30$$

† The Present age of the son is 30 years.

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**3. The ratio between the present ages of P and Q is 6: 8 respectively. If the difference between Q's present age and P's age after 5 years is 3. What is the total of P's and Q's present ages?**

**Answer:** 56 years

**Explanation:**

Let the present ages of P and Q be  $6x$  and  $8x$  years respectively

Given,  $8x - (6x + 5) = 3$

$$8x - 6x - 5 = 3$$

$$2x = 3 + 5$$

$$2x = 8$$

$$x = 4$$

(P's + Q's) present ages =  $6x + 8x$

$$= 14x$$

$$= 14 * 4$$

$$= 56 \text{ years}$$

∴ P's and Q's present ages = 56 years.

**4. A is three years older than B who is twice as old as C. If the total of the ages of A, B and C be 48, then how old is B?**

**Answer:** 18 years

**Explanation:**

Let C's age be  $x$  years

Then, B's age =  $2x$  years and

A's age =  $(2x + 3)$  years

$$(2x + 3) + 2x + x = 48$$

$$5x + 3 = 48$$

$$5x = 48 - 3$$

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$$5x = 45$$

$$x = 9$$

$$\text{B's age} = 2x$$

$$= 2 * 9$$

$$= 18 \text{ years}$$

† B's age = 18 years.

**5. Sachu is younger than Ragu by 8 years. If their ages are in the respective ratio of 5 : 7, how old is Sachu?**

**Answer:** 20 years

**Explanation:**

Let Ragu's age be  $x$  years.

Then, Sachu's age =  $(x - 8)$  years

$$(x - 8) / x = (5 / 7)$$

$$7x - 56 = 5x$$

$$2x = 56$$

$$x = 28$$

Hence, Sachu's age =  $(x - 8)$

$$= 28 - 8$$

$$= 20 \text{ years}$$

† Sachu's age = 20 years

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**6. The sum of ages of family members (both children and parents) is 324 years. The total ages of children and parents are in the ratio 2 : 1 and the ages of wife and husband are in the ratio 4 : 5. What will be the age of husband?**

**Answer:** 60 years

**Explanation:**

Given data,

Sum of their ages = 324

The ratio of children and parents ages is 2 : 1

Total ages of parents =  $324 * (1 / 3)$

= 108

The ratio of wife and husband ages is 4 : 5

Therefore, the age of husband =  $108 * (5 / 9)$

= 60 years

✦ The age of husband is 60 years.

**7. The ratio between the present ages of A and B is 7 : 8. If B is 4 years old than A. What will be the ratio of the ages of A and B after 4 years?**

**Answer:** 8 : 9

**Explanation:**

Let A's age and B's age be  $7x$ ,  $8x$

Then,  $8x - 7x = 4$

$x = 4$

Required ratio =  $(7x + 4) : (8x + 4)$

=  $(7 * 4 + 4) : (8 * 4 + 4)$

= 32 : 36

= 8 : 9

✦ The ratio of the ages of A and B after 4 years is 8 : 9.

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**8. The sum of ages of 6 children born at the intervals of 4 years each is 72 years. What is the age of the youngest child?**

**Answer:** 2 years

**Explanation:**

Let the ages of children be  $x, (x + 4), (x + 8), (x + 12), (x + 16), (x + 20)$  years.

Then,  $x + x + 4 + x + 8 + x + 12 + x + 16 + x + 20 = 72$

$$6x + 60 = 72$$

$$6x = 72 - 60$$

$$6x = 12$$

$$x = 12 / 6$$

$$x = 2$$

Then, age of the youngest child =  $x$

= 2 years

† Age of the youngest child = 2 years

**9. Present ages of Somu and Vinoth are in the ratio of 9 : 2 respectively. Five years ago, the ratio of their ages will become 22 : 1 respectively. What is their present age in years?**

**Answer:** 27 years, 6 years

**Explanation:**

Their present ages =  $9x, 2x$

5 years ago, Somu's age =  $9x - 5$

5 years ago, Vinoth's age =  $2x - 5$

Ratio of their ages 5 years ago = 22 : 1

$$(9x - 5) / (2x - 5) = 22 / 1$$

$$1(9x - 5) = 22(2x - 5)$$

$$9x - 5 = 44x - 110$$

$$44x - 9x = 110 - 5$$

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$$35x = 105$$

$$x = 105 / 35$$

$$x = 3$$

$$\text{Their present ages} = 9 * 3, 2 * 3$$

$$= 27, 6$$

† Their present ages = 27 years, 6 years

**10. The age of the three persons is in the ratio 3 : 5 : 9. Four years ago, the sum of their ages is 39. Six years ago, what are their ages?**

**Answer:** 3 years, 9 years, 21 years

**Explanation:**

The present ages of the three persons =  $3x, 5x, 9x$

4 years back, the sum of their ages = 39

4 years back, the ages of the three persons =  $(3x - 4), (5x - 4), (9x - 4)$

[From the given question, we can write]

$$3x - 4 + 5x - 4 + 9x - 4 = 39$$

$$17x - 12 = 39$$

$$17x = 39 + 12$$

$$= 51$$

$$x = 51 / 17$$

$$= 3$$

The present ages of the three persons =  $(3 * 3), (5 * 3), (9 * 3)$

$$= 9, 15, 27$$

6 years back, their ages =  $9 - 6, 15 - 6, 27 - 6$

$$= 3, 9, 21$$

† 6 years back, their ages = 3 years, 9 years, 21 years

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## Problems for Practice:

1. Father is aged three times more than his son Ronit. After 8 years, he would be two and a half times of Ronit's age. After further 8 years, how many times would he be of Ronit's age?
2. The sum of ages of 5 children born at the intervals of 3 years each is 50 years. What is the age of the youngest child?
3. A father said to his son, "I was as old as you are at the present at the time of your birth". If the father's age is 38 years now, the son's age five years back was:
4. A is two years older than B who is twice as old as C. If the total of the ages of A, B and C be 27, then how old is B?
5. Present ages of Sameer and Anand are in the ratio of 5 : 4 respectively. Three years hence, the ratio of their ages will become 11 : 9 respectively. What is Anand's present age in years?

## Average

### Formulas:

**Average** =  $\frac{\text{Sum of observations}}{\text{Number of observations}}$

### Average Speed:

Suppose a man covers a certain distance at  $x$  kmph and an equal distance at  $y$  kmph.

Then, the average speed during the whole journey is  $\frac{2xy}{x + y}$  kmph.