24/11/25

1. The ratio of ages of A & B is 5:9 and the age of one of them is greater than the other by 40 years. Find the sum of the ages.

Soln:-

5 : 9

$5x + 40 = 9x$

$9x - 5x = 40$

$4x = 40$

$\boxed{x = 10}$

Age of A = 5(10) = 50

Age of B = 9(10) = 90

sum = 140

4 parts = 40

1 part = 10

sum = 5+9 = 14P

= 140

2. The ratio of ages of A & B is 6:5 respectively. After 9 years the ratio of their ages will 9:8. What is the difference between their ages now?

Soln:-

6 : 5

9 : 8

$\frac{6x+9}{5x+9} = \frac{9}{8}$

$48x + 72 = 45x + 81$

$3x = 9$

$\boxed{x = 3}$

diff = 6x - 5x

= x (3 years)

$\boxed{\text{diff} = 3}$

6 : 5 (3 parts)

9 : 8 (3 parts)

3 parts = 9 yrs

1 part = 3 yrs

6 - 5 = 1 part

diff = 3 yrs

3. The present ages of Raju and his father is 2:5. 4 years hence the ratio will become 5:11 respectively. What is the fathers age 5 years ago?

Soln:-

R : F

2 : 5

5 : 11

$\frac{2x+4}{5x+4} = \frac{5}{11}$

$22x + 44 = 25x + 20$

$3x = 24$

$\boxed{x = 8}$

Raju = 2×8 = 16

Father = 5×8 = 40

5 yrs ago,

Father's age = 35 yrs

4. 10 years ago, P was half of Q's age. If the ratio of present ages is 3:4. What is the total of their present ages?

soln:

$$\frac{3x-10}{4x-10} = \frac{1}{2}$$

$$6x - 20 = 4x - 10$$

$$2x = 10$$

$$x = 5$$

$$3x + 4x = 3(5) + 4(5)$$

$$= 15 + 20$$

Sum = 35

before 10 yrs

P : Q = 1 : 2

P : Q = 3 : 4 (2 parts)

2 parts = 10 years

1 part = 5 years

3(5) + 4(5) = 15 + 20

= 35

5. Raju married 8 years ago. Today his age is 9/7 times the age at the time of his marriage. At present his daughter age is 1/6 of his age. What is his daughters age 3 years ago?

soln:-

$$R = \frac{9}{7}(R-8)$$

$$7R = 9R - 72$$

$$2R = 72$$

$$R = 36$$

$$D = \frac{1}{6}R = \frac{1}{6}(36)$$

$$D = 6 \text{ yrs}$$

3 years ago, => 3 years.

6. The average age of Ram and his daughter is 34 years. The ratio of their ages 4 years from now is 14:5. What is daughter's present age?

soln:-

$$\frac{x+y}{2} = 34 \qquad x + y = 68$$

After 4 yrs,

$$R = 14x, \quad D = 5x$$

$$14x - 4 + 5x - 4 = 68$$

$$19x - 8 = 68$$

$$19x = 76$$

$$x = 4$$

Daughters age = $5 \times 4 - 4$

$= 20 - 4$

$= 16$

7. The age of father 10 years ago was thrice the age of his son. 10 years hence the father's age is twice the age of his son. Find the ratio of present ages?

Soln:-

10 years ago,

$$F - 10 = 3(S-10) \Rightarrow F = 3S - 30 + 10 = 3S - 20$$

10 years hence,

$$F + 10 = 2(S+10) \Rightarrow F = 2S + 20 - 10 = 2S + 10$$

$$F + 10 = 2S + 20$$

$$3S - 20 + 10 = 2S + 20$$

$$S = 20 - 10 + 20$$

$$\boxed{S = 30}$$

$$F - 10 = 3(30 - 10)$$

$$F - 10 = 90 - 30$$

$$F = 60 + 10$$

$$\boxed{F = 70}$$

Ratio: 70:30

$\Rightarrow 7:3$

8. The ratio between ages of A & B is 4:5 and that of A & C is 5:6. If the sum of ages of all the three Ps 69 years, find the age of B.

Soln:-

$$A:B = (4:5) \times 5 = 20:25$$

$$A:C = (5:6) \times 4 = 20:24$$

$$A:B:C = 20:25:24$$

$$20x + 25x + 24x = 69$$

$$69x = 69$$

$$x = 1$$

B's age $= 25(1)$

$= 25$ yrs

9. The difference between present ages of A & B is 14 yrs. 7 yrs ago the ratio of their ages is 5:7 respectively. What is the present age of B?

soln:-

Ratio: A : B (older)
5 : 7

B − A = 14 yrs

$(7x-7)-(5x-7)=14$

$7x-7-5x+7=14$

$2x=14$

$x=7$

B's age at present $= 7x+7$

$= 7(7)+7 = 49+7$

B's age = 56 yrs

10. Average age of A, B & C is 10 yrs less than the age of C. If the ratio of present ages of A, B & C is 3:4:5. What is the sum of ages of A & C.

soln:-

$\frac{A+B+C}{3} = C-10$

$A:B:C = 3:4:5$

$3x+4x+5x = 3(5x-10)$

$12x = 15x-30$

$3x = 30$

$x = 10$

$A+C = 3x+5x$

$= 30+50$

$A+C = 80$

$5x = \frac{12x}{3}+10$

11. A's age is $1/3^{rd}$ of B's age. B is $\frac{4}{5}$th of C' age and C is $3/5^{th}$ of D's age. Find the age of A if the age of D is 50 years

soln:-

$\frac{1}{3} \times \frac{4}{5} \times \frac{3}{5} \times 50^{10\,2} = 8$

12. In 10 years A will be twice as old as B was 10 years ago. If A is now 9 years older than B. Find the present age of B.

Soln:

$A = B + 9$

After 10 yrs,

$10 + A = 2(B - 10)$

$B + 9 + 10 = 2(B - 10)$

$B + 19 = 2B - 20$

$\boxed{B = 39}$

13. Raju's father was 40 years old when he was born and his mother's age is 36 years when his brother 4 years younger than him was born. What is the difference in the ages of his parents?

Soln:-

$F = 40$

When Raju's brother born

$M = 36$

When Raju born,

$M = 32$

$F - M = 40 - 32$

$= 8$ yrs

14. The sum of ages of five children born at the intervals of 3 years each is 50 yrs. Find the age of oldest child.

Soln:-

$x + (x+3) + (x+6) + (x+9) + (x+12) = 50$

$5x + 30 = 50$

$5x = 20$

$x = 4$

The oldest child's age $= x + 12$

$= 4 + 12$

$= 16$

15. The ratio of sachin's age to his son is 7:3 and product of their ages is 756. Find the ratio of their ages after 6 yrs.

Soln:-

$7x \times 3x = 756$

$21x^2 = 756$

$x^2 = \frac{756}{21}$ (21 | 756 | 36)

$x^2 = 36$

$\boxed{x = 6}$

Current age = 42, 18

After 6 years = 48 : 24

$\boxed{= 2:1}$

16. A & B got married 10 years ago. At the time of their marriage the average age of both persons was 25 years. Today they have a child whose age is 5 years. What is the average age of the family now?

Soln:-

$$\frac{A-10+B-10}{2} = 25$$

$$A+B-20 = 50$$

present age, $A+B = 70$

$$\frac{A+B+C}{3} = \frac{70+5}{3} = \frac{75}{3}$$

$= 25$ yrs.

17. A is as much younger to B as he is older to C. If the total ages of B & C is 48 yrs. Find the age of A.

Soln:-

$A = B - x$ $\quad B + C = 48$

$A = C + x$

$B = A + x$

$C = A - x$

$B + C = A + x + A - x$

$48 = 2A$

$\boxed{A = 24 \text{ yrs}}$

18. The ratio of ages of a man and his wife is 4:3. After 4 years the ratio will be 9:7. If at the time of marriage, the ratio of their ages is 5:3, then how many years ago, they have got married?

Soln:-

$$\frac{4x+4}{3x+4} = \frac{9}{7} \Rightarrow 28x+28 = 27x+36$$

$$x = 8$$

man's age = 32

woman's age = 24

$$\frac{32-x}{24-x} = \frac{5}{3}$$

$$96-3x = 120-5x$$

$$2x = 24$$

$$\boxed{x = 12}$$

19. 4 years ago the ratio of half of A's age at the time and 4 times of B's age at that time was 5:12. 8 years hence half of A's age at that time will be less than B's age at that time by 2 years. Find the present age of B.

Soln:-

4 years ago,

$$\frac{A-4}{2} : 4(B-4) = 5:12$$

$$\frac{\frac{A-4}{2}}{4(B-4)} = \frac{5}{12} \Rightarrow \frac{A-4}{8(B-4)} = \frac{5}{12}$$

$$12A-48 = 40B-160$$

$$3A-12 = 10B-40$$

$$3A-10B = -28$$

$$\frac{A+8}{2}+2 = B+8$$

$$\frac{A+8}{2} = B+6$$

$$A+8 = 2B+12$$

$$A = 2B+4$$

$$3(2B+4)-12 = 10B-40$$

$$-4B = -40$$

$$\boxed{B = 10}$$

20. Thanya's grandfather was 8 times older to her 16 years ago. He would be 3 time of her age 8 years from now. 8 years ago. what was the ratio of thanyas age to that of her grandfather?

soln:-

$$T-16 = \frac{G_1-16}{8}$$

$$T+8 = \frac{G_1+8}{3}$$

G1	T	
8	1	$5p = 48$
3	1	
24	24	$1p = \frac{48}{5}$

present age,

$G_1 = 8x+16$

$T = x+16$

8 years ago

$G_1 = 8x+8$

$T = x+8$

$$\frac{T}{G_1} = \frac{x+8}{8x+8} = \frac{\frac{48}{5}+8}{8\times\frac{48}{5}+8} = \frac{8\left[1+\frac{6}{5}\right]}{8\left[1+\frac{48}{5}\right]}$$

$$= \frac{11}{8} / \frac{53}{5}$$

$$= 11:53$$

05/11/25

1. 20% of 45% of a number is 81. Find the number.

soln:-

$20\%(45\% \text{ of } x) = 81$

$\frac{20}{100} \times \frac{45}{100} \times x = 81$

$90x = 81000$

$\boxed{x = 900}$

$\frac{20}{10}\%$ of $\frac{45}{10}\% \rightarrow 81$

$2 \times 4.5\% = 81$

$9\% = 81$

$1\% = 9$

$100\% = 900$

2. A number is increased by 22½% is 98. Find the number.

soln:

$x + \frac{22.5}{100}x = 98$

$x + \frac{225x}{1000} = 98$

$1225x = 98000$

$x = \frac{98000}{1225}$

$x = 80$

$100\% + \frac{45}{2}\% = 98$

$\frac{245}{2}\% = 98$

$100\% = 98 \times \frac{2}{245} \times 100$

$= 80$

3. When a number is increased by 216, it becomes 140% of itself.

soln:-

$\frac{140}{100} \times x = x + 216$

$140x = 100x + 21600$

$40x = 21600$

$x = \frac{21600}{40}$

$x = 540$

$40\% = 216$

$10\% = \frac{216}{4}$

$= 54$

$100\% = 540$

4. The sum of 2 numbers is 520. If the bigger number is decreased by 4% & the smaller number is increased by 12% Then the numbers obtained are equal. Find the smaller number.

soln:-

$x + y = 520$ $\quad x = 520 - y$

$x - 4\%\text{ of } x = y + 12\%\text{ of } y$

$x - \frac{4x}{100} = y + \frac{12y}{100}$

$\frac{96x}{100} = \frac{112y}{100}$

$6x = 7y$

$6x - 7y = 0$

$6(520 - y) - 7y = 0$

$3120 - 6y - 7y = 0$

$3120 = 13y$

$y = \frac{3120}{13}$

$y = 240$

5. In an examination Ramesh scored 30% less than suresh and mahesh scored 20% less than suresh. Ramesh score is what percentage of mahesh score.

soln:-

$\frac{\text{Ramesh}}{\text{Mahesh}} \times 100\%$

Let suresh = 100

Ramesh = 70

Mahesh = 80

$\frac{70}{80} \times 100\% = \boxed{87.5\%}$

6. The profit made by a company in the present year is ₹1,50,000. 2 years ago the profit made by the same company was ₹2,40,000. What is the percentage change in the profit?

soln:-

$$\text{change} = \frac{240000 - 150000}{240000} \times 100\%$$

$$= \frac{90000}{240000} \times 100$$

$$= 37.5\% \text{ decrease.}$$

240000
150000
90000

12.5 × 3
37.5

% increase = $\frac{\text{diff}}{\text{min. num}} \times 100\%$

% decrease = $\frac{\text{diff}}{\text{max. num}} \times 100\%$

7. In a test consisting of 300 questions a student answered 40% of first 100 question correctly. What percentage of remaining question that he need to answer correctly inorder to get 50% over the entire exam.

soln:-

300 $\xrightarrow{50\%}$ 150

1st 100 $\longrightarrow$ 40%.

200 $\longleftarrow$ 110

$$\% = \frac{110}{200} \times 100$$

$$\% = 55\%.$$

8. A vendor sells 50% of apples he had and thrown 20% of the remaining. On the next day, he sells 60% of the remaining apples and throws away the rest. What % of apples does the vendor thrown away?

soln:- Day-1 Total - 100

sell - 50 apples

thrown = $\frac{20}{100} \times 50 = 10$

Day-2

sell = $\frac{60}{100} \times 40 = 24$

Thrown = 16

Total thrown percentage = 26%

9. If a triangle base is increased by $66\frac{2}{3}\%$ then by how much percentage height should be decreased such that area of the triangle remains constant?

soln:-

$A = \frac{1}{2} \times b \times h$

$66\frac{2}{3}$

$\frac{2}{3} \times 100 \rightarrow 66.66\%$

$b = \frac{100\%}{1} + 66.66\%$

$1 + \frac{2}{3} = \frac{5}{3}$

$$\%\text{decrease} = \frac{h - \frac{3}{5}h}{h} \times 100$$

$$= \frac{(1 - \frac{3}{5})h}{h} \times 100$$

$$= (1 - \frac{3}{5}) \times 100 = \frac{2}{\cancel{5}_{1}} \times \cancel{100}^{20} = 40\%$$

10. The price of a commodity is increased by 24% and the quantity purchase is decreased by 20%. What is the percentage increase or decrease on the amount spent on the commodity?

soln:-

price $\rightarrow$ 24% ↑ quantity $\rightarrow$ 20% ↓

Expenditure/Amount = Price × Quantity

$$E = \frac{124}{\cancel{100}_{25}} P \times \frac{\cancel{80}^{4}}{\cancel{100}_{5}} Q \Rightarrow E$$

$$E = \frac{124}{125} E$$

$$\%\text{decrease} = \frac{E - \frac{124}{125}E}{E} \times 100$$

$$= \frac{(1 - \frac{124}{125})E}{E} \times 100$$

$$= \frac{1}{\cancel{125}_{25}} \times \cancel{100}^{20}$$

$$= \frac{1}{5}$$

%decrease = 0.8%

$E = P \times Q$ (a% b%)

1) $P\uparrow Q\uparrow \Rightarrow E\uparrow$

$E\uparrow = a+b+\frac{ab}{100}$

2) $P\downarrow Q\downarrow = E\downarrow$

$\%E\downarrow = -a-b+\frac{ab}{100}$

3) $P\downarrow Q\uparrow$

$\%_{change\ in} E = a-b-\frac{ab}{100}$

4) $P\uparrow Q\downarrow$

$\%_{change\ in} E = -a+b-\frac{ab}{100}$

1. Ragul's working hour per day is increased 15% and his wages per hour is increased by 20%. By how much percentage his daily earnings increased?

soln:-

$a+b+\frac{ab}{100}$

work↑, wages↑

$= 15+20+\frac{300}{100}$

$= 38\%$

2. A trader marks the price 8% higher than the original price. Due to increase in demand he again increases the price by 10%. What is the profit percentage he gets?

soln:- Let the initial price be 100

increase by 8 = 108

increase by 10% = 108 + 10·8

= 118·8

$\% inc = \frac{18.8}{100} \times 100$

% inc = 18·8 %

successive % $= a+b+\frac{ab}{100}$

$= 8+10+\frac{80}{100}$

$= 18+0.8$

$= 18.8\%$

13. Initial length of a rectangular box is 20 cm. The box is remade such that its length is increased by 30%. But the breadth is reduced by 20%. If the area is increased by 100 cm^2 then find the new area of rectangular box.

Soln:-

$l = 20cm \quad b = b \quad Area = 20b$

$l' = 20 + \frac{30}{100} \times 20 \quad b' = b - \frac{20}{100} b'$

$= 26cm \quad b' = \frac{4b}{5}$

$b' = \frac{4 \times \frac{25}{125}}{5}$

$= 100$

$A' = l' \times b'$

$= 26 \times \frac{4b}{5}$

$104b - 100b = 500$

$4b = 500$

$b = 125$

$A' = 100 + A$

$26 \times \frac{4b}{5} = 20b = 100$

$A' = l' \times b$

$= 26 \times 100$

$= 2600$

14. A man's annual income has increased by 1.2 lakhs but the tax on the income he has to pay is reduced from 12% to 10%. due to which he pays same amount of tax as before. What is his increased income?

Soln:-

Tax amount = Income × % tax

$Income \propto \frac{1}{\% Tax}$

$\frac{I_1}{I_2} = \frac{T_2}{T_1}$

$\frac{x}{x+1.2} = \frac{10}{12}$

$12x = 10x + 12$

$x = 6$

Increased income $= x + 1.2$

$= 6 + 1.2$

$= 7.2$

adult population in a certain village 21% of men & % of women are married. Assuming that no man arries more than a woman and vice versa. Find the tal percentage of adult population that are married?

n:-

21% = men's

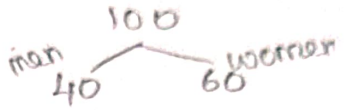
14% = women's

21% of x = 14% of y

$\frac{21}{100}x = \frac{14}{100}y$

$\frac{x}{y} = \frac{14}{21} = \frac{2}{3}$

$x : y = 2 : 3$



$\frac{21}{100} \times 40$ $\frac{14}{100} \times 60$

8.4% + 8.4%

= 16.8%.