

TEST SERIES DISCUSSION-1

Q1. P can complete five-eighths of a work in 15 days and Q can complete three-fourths of the same work in 30 days. They worked together for 8 days and then P left. How much time will Q working alone, take to complete the remaining work?

$$\frac{15 \times 8}{5} = \frac{24}{5} \rightarrow \frac{8}{5} \text{ days}$$

$$30 \times \frac{4}{3} = 40 \rightarrow \frac{18}{3} \text{ days}$$

$$P = \frac{24}{5} \text{ days}$$

$$Q = \frac{18}{3} \text{ days}$$

$$P+Q = \frac{24}{5} + \frac{18}{3} = \frac{56}{3} \text{ days}$$

$$1 = \frac{30 \times 4}{3} = 40 \text{ days}$$

~~eff~~ 5 120 (work)

$$P = \frac{24}{5} \text{ days}$$

$$Q = \frac{18}{3} \text{ days}$$

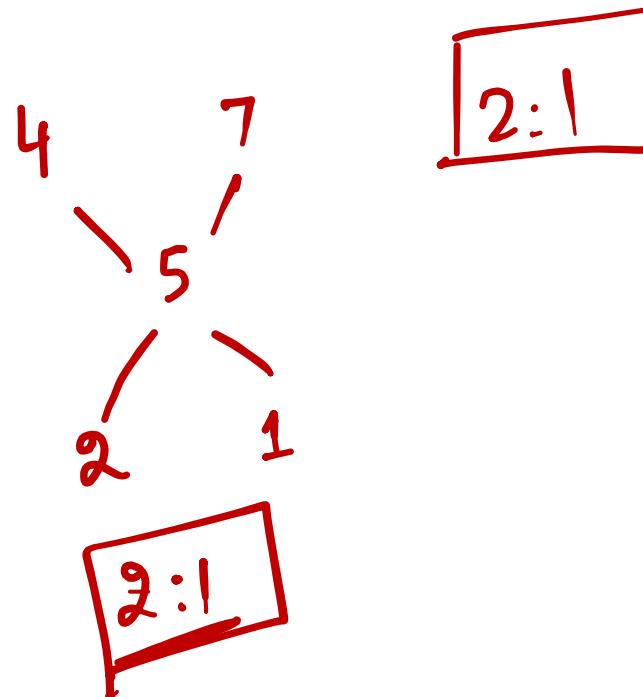
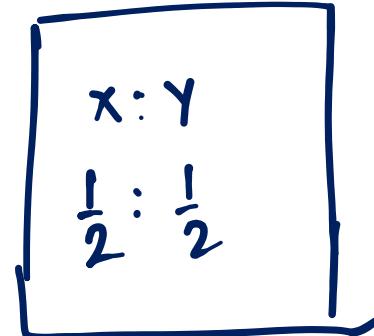
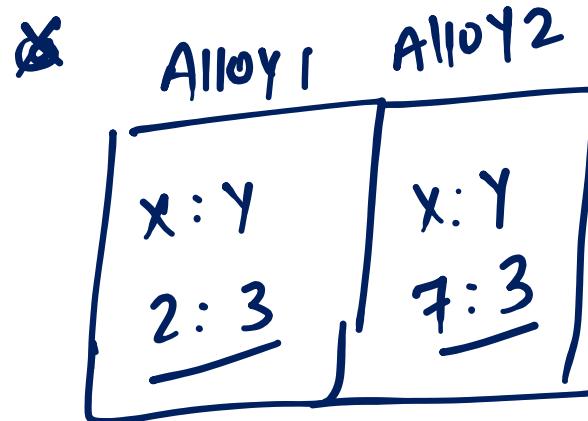
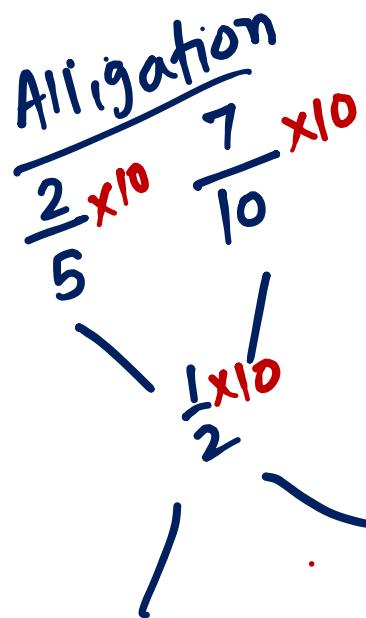
$$\frac{(P+Q) \times 8}{(5+3) \times 8} = \frac{56}{56} = 1$$

$$\frac{56}{3} = 18 \frac{2}{3} \text{ days}$$

$$= 18 \text{ days} + \frac{2 \times 24}{3} = 18 \text{ days } 16 \text{ hrs}$$

TEST SERIES DISCUSSION-1

Q2. An alloy contains a mixture of two metals X and Y in the ratio of 2 : 3. The second alloy contains a mixture of the same metals, X and Y, in the ratio 7 : 3. In what ratio should the first and the second alloys be mixed so as to make a new alloy containing 50% of a metal X ?



TEST SERIES DISCUSSION-1

Q3 The batting average for 27 innings of a cricket player is 47 runs. His highest score in an innings exceeds his lowest score by 157 runs. If these two innings are excluded, the average score of the remaining 25 innings is 42 runs. Find his highest score in an innings. ?

$$L + H$$

$$\frac{47 \times 27}{329} = 94$$

$$\text{sum}_{27} = 1269$$

$$\text{sum}_{25} = 1050$$

$$L + H = 219$$

$$\text{Avg} = \frac{\text{Sum}}{\text{No}}$$

$$47 = \frac{\text{sum}_{27}}{27}$$

$$\text{sum}_{27} = 47 \times 27$$

$$= 1269$$

$$H = L + 157 \quad \textcircled{2}$$

H & Low \rightarrow Exclude

$$\text{sum}_{25} = 25 \times 42 = 1050$$

$$\text{sum}_{27} - \text{sum}_{25} = H + L$$

$$1269 - 1050 = H + L$$

$$H + L = 219$$

$$H + L = 157$$

$$2H = 376$$

$$H = 188$$

$$27 - 2 = 25$$

TEST SERIES DISCUSSION-1

Q4. Sonali applied for a job of Science teacher in a school. In the test for job, she scored 8 in Physics, 8 in Chemistry, 6 in Biology, and 6.5 in the interview. For calculating the final score, weightage of 2, 3, 3 and 4 were assigned to Physics, Chemistry, Biology and interview, respectively. What is the weighted average score of Sonali? ?

Average

Statistics
Mean

Weight avg score : 7

$$\frac{8 \times 2 + 8 \times 3 + 6 \times 3 + 6.5 \times 4}{2 + 3 + 3 + 4} = \frac{84}{12} = 7$$

TEST SERIES DISCUSSION-1

Q5 A car with a price of Rs. 6,50,000 is bought by making some down payment [On the balance, a simple interest of 10% is charged in lump sum and the money is to be paid in 20 equal annual instalments of Rs. 25,000. How much is the down payment?

CI installment
x is down payment

$6,50,000 \rightarrow 2,00000$

$400000 + SI$ $\frac{2}{100} \frac{1}{5}$

$10\% = \frac{1}{10}$ $x = 19$

$(6,50,000 - x) \times \frac{11}{10} = 20 \times 25,000$

$650000 \times 11 - 11x = 5000000$

$11x = 6715000 - 5000000$

$11x = 1715000$

$x = 156818.18$

TEST SERIES DISCUSSION-1

Q6. Sanny scored 50% of total marks in an examination of engineering service exam and after review, an examiner increased his marks by 10%. In spite of doing this, he is failed by 35 marks. If his post review score is decreased by 20%, he requires 79 marks to pass the exam. Find the passing percentage?

Total marks $\frac{100}{1}$

$50 \cdot 1 \cdot \frac{*10}{100}$

" $50 \cdot 1 \cdot \frac{20}{100}$

$55 \cdot 1 \cdot +35$

" $63 \cdot 75 \cdot 1$

Sanny = $50 \cdot 1 \cdot$

Examiner = $10 \cdot 1 \cdot \text{marks} \rightarrow 5+$

Sanny = $55 \cdot 1 \cdot$

Pass marks

$55 \cdot 1 \cdot +35 \checkmark$

$55 \cdot 1 \cdot -11 \cdot 1 \cdot = 44 \cdot 1 \cdot$ (Pass)

$55 \cdot 1 \cdot +35 = 44 \cdot 1 \cdot +79$

$11 \cdot 1 \cdot = 44$

$4 = 1 \cdot 1 \cdot$

$1 = \frac{1}{4} \cdot 1 \cdot$

$35 = \frac{8.75}{4} \cdot 35$

Prachi = $20 \cdot 1 \cdot +10$

Ab = $15 \cdot 1 \cdot +15$

$20 \cdot 1 \cdot +10 = 15 \cdot 1 \cdot +15$

$30 = 30$

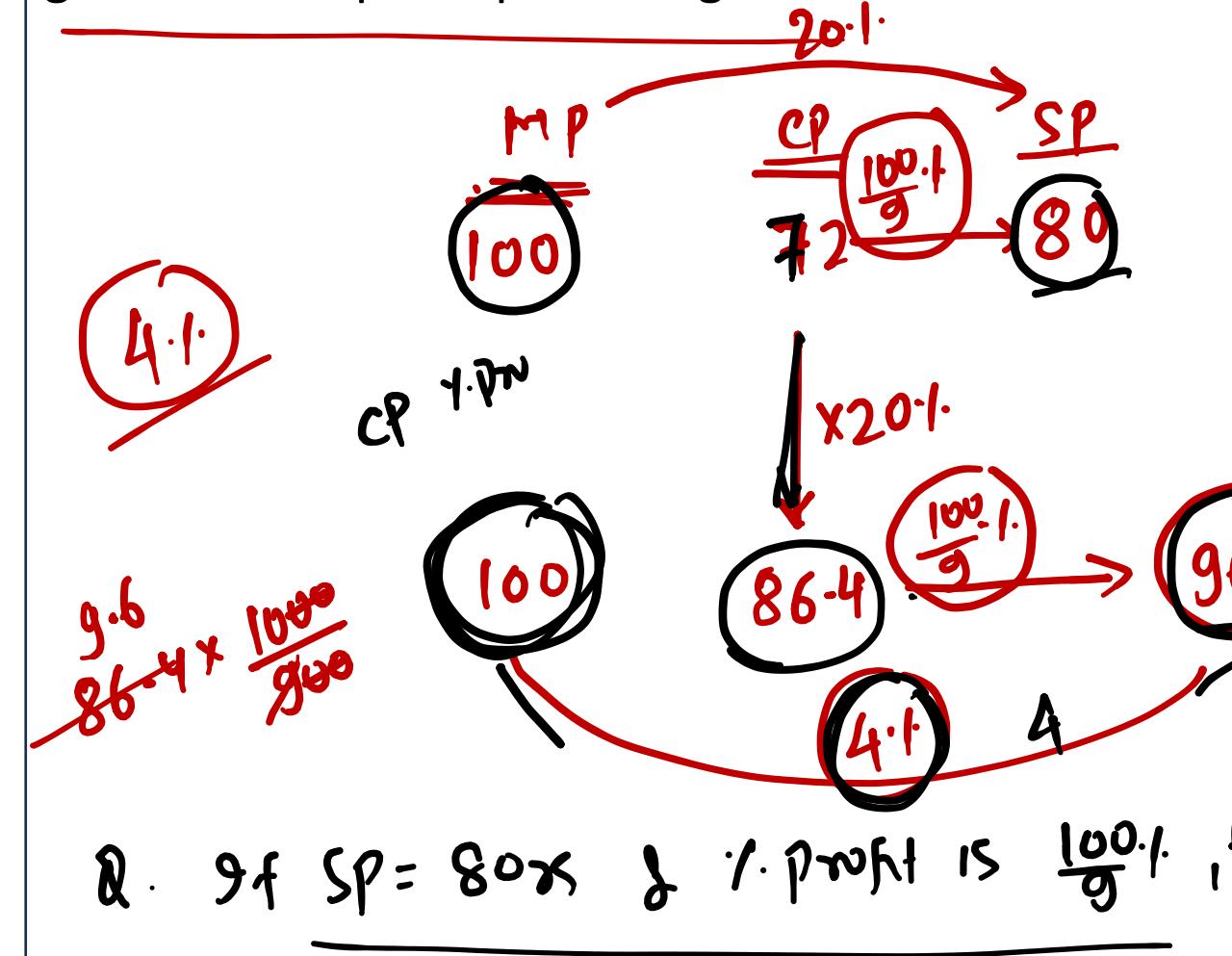
$30 \quad 20 \cdot 1 \cdot +10$

$15 \cdot 1 \cdot = 15$

$10 \cdot 1 \cdot +20$

TEST SERIES DISCUSSION-1

Q7. A trader allows a 20% discount on the marked price of the article and gains $11\frac{1}{9}\%$. If the cost price increases by 20%, How much discount price should be now given on the same marked price to get the same profit percentage as before?



$$11\frac{1}{9}\% = \frac{100}{9}\% \rightarrow 10\%$$

$$SP = CP \times \frac{(100 + \% \text{ Profit})}{100}$$

$$80 = CP \times \frac{(100 + \frac{100}{9})}{100}$$

$$80 = CP \times \frac{1600}{900}$$

① $SP = 80$
 $\% \text{ Profit} = 11\frac{1}{9}\%$
 $CP \checkmark$

② $CP = 86.4$
 $\% \text{ Profit} = 11\frac{1}{9}\%$
 $SP \checkmark$

TEST SERIES DISCUSSION-1

Q8. What is the mean of the mode and median of the data.

~~18, 11, 15, 14, 19, 16, 13, 16, 11, 13, 16, 12, 11, 17, 12, 15, 16, 14~~

Statistics

0	1	✓		
-	-	-	-	-

Median = ascending

16 = Mode = Most frequent
Mean = Avg.

observation

medi
2 3 4 3
2 3 4 5 $\frac{3+4}{2}$

11, 11, 11, 12, 12, 13, 13, 14] 14, 15 [15, 16, 16, 16, 17, 18, 19

$$\text{mean} = \frac{16+14.25}{2}$$

$$= \frac{30.25}{2}$$

$$\frac{14+15}{2} = \frac{29}{2} = 14.25$$

$$= 15.25$$

TEST SERIES DISCUSSION-1

Q9. If $(x+10)\%$ of 240 is ~~60% more than $x\%$ of 180~~ then 15% of $(x+20)$ is what percent less than ~~25% of x~~

$$\checkmark \quad (x+10)\% \text{ of } 240 = \frac{3}{5} \times \frac{160}{100} \times x\% \text{ of } 180$$

\therefore more / profit / increment

$$\left(\frac{100+x}{100} \right) \checkmark$$

~~15% of 100~~

$$5x + 50 = 6x$$

$$x = 50 \quad \checkmark$$

$$\frac{1}{4} \times 25 \quad 12.5 \quad 12.5 \cdot 1 = \frac{1}{8}$$

Reordered Basic

$$A = 12080$$

$$B = 8120$$

$$15\% \text{ of } (70) - 25\% \text{ of } 50$$

$$10.5 - 12.5 = \left[\frac{2}{12.5} \times \frac{100}{8} - 16\% \right]$$

$$\frac{40}{120} \times 100 \quad \frac{3}{3} = 33.33\%$$

TEST SERIES DISCUSSION-1

Q10. The salary in rs of 10 employees in a company per day is 50, 55, 60, 65, 70, 72, 75, 80, 84, 89, what is the standard deviation of the above data ? .

medical result

Mean \times

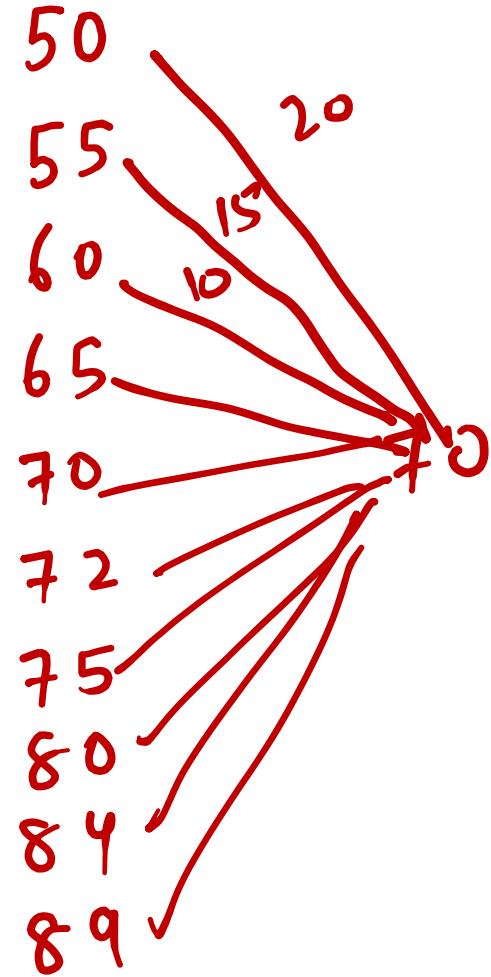
1.0

1.00 1.5 Lakh

0.5 Lakh

$(20)^2 + (15)^2 + \dots + (19)^2$

10



Mean:

$$= \frac{50 + 55 + \dots + 89}{10}$$
$$= \frac{700}{10} = 70$$

TEST SERIES DISCUSSION-1

Q11.

If $\sqrt[3]{\frac{4913}{4096}} = 1 + \frac{a}{16}$, what is the value of a?

$$\frac{17}{16} = 1 + \frac{a}{16}$$

$$\frac{17}{16} - 1 = \frac{a}{16}$$

$$\frac{1}{16} = \frac{a}{16}$$

$$a=1$$

$$, \sqrt[3]{4096}$$

$$17 \\ 16$$

$$1^3 = 1 \\ 2^3 = 8 \\ 3^3 = 27$$

$$4^3 = 64$$

$$5^3 = 125$$

$$6^3 = 216$$

$$7^3 = 343$$

$$8^3 = 512$$

$$9^3 = 729$$

TEST SERIES DISCUSSION-1

Q12

If $\sqrt{2} = 1.414$ and $\sqrt{3} = 1.732$ the value of $\frac{1}{3\sqrt{2}-2\sqrt{3}}$?

$$\frac{(a-b)(a+b)}{a^2-b^2} = \frac{1}{3\sqrt{2}-2\sqrt{3}} \times \frac{3\sqrt{2}+2\sqrt{3}}{3\sqrt{2}+2\sqrt{3}}$$
$$\frac{(3\sqrt{2})^2 - 9 + 2 = 18}{(3\sqrt{2})^2 = 9 + 2 = 18}$$
$$\frac{3\sqrt{2}+2\sqrt{3}}{18-12} = \frac{1.2803}{1.2803}$$
$$\frac{3 \times 1.414 + 2 \times 1.732}{6}$$

$$\sqrt{2} = 1.414$$

$$\sqrt{3} = 1.732$$

\times $\frac{1}{2432}$
 $\checkmark \frac{1024}{16}$

TEST SERIES DISCUSSION-1

Q13. The following table gives the expenditure of a company(in lakhs or rupees per annum) over the given years.

What percentage of total expenditure in 2018 is the total expenditure on all these items in 2016.

Expenditure/ Year	Salary	Transport	Bonus	Taxes	Advertiseme nt
2015	250	105	4	80	2.1
2016	198.7	72.70	4.25	75.75	13.3
2017	270	110	4.5	85	3.5
2018	318	108	93.7	158.2	22.1
2019	325	120	5	75	4.3

$$\begin{array}{r} 198 \quad 200 \\ 76 \\ 88 \\ \hline 364 \\ 364.70 \times 100 \\ \hline 700 \\ \text{a} \end{array}$$

52.1%

$$\begin{array}{r} 319 \\ 108 \\ 93 \\ 158 \\ 22 \\ \hline 700 \end{array}$$

TEST SERIES DISCUSSION-1

Q14. What is the value of $x:y$?

If x and y are two positive integers such that

$$4:3 = x:y$$

$$(4x^2 - 3y^2) : (2x^2 + 3y^2)$$

$$= 37:59. \checkmark$$

(1. ratio) a

Assu $21:5$

$$162x^2 = 288y^2$$

$$\frac{x^2}{y^2} = \frac{288}{162} \frac{144}{81}$$

$$\frac{x}{y} = \frac{12}{9} \frac{4}{3}$$

$$\frac{4x^2 - 3y^2}{3x^2 + 2y^2}$$

$$\frac{4x^2 - 3y^2}{3x^2 + 2y^2} = \frac{37}{59}$$

$$4:3$$

$$\frac{x}{y} = \frac{4}{3}$$

$$\frac{236x^2 - 177y^2}{236x^2 + 111y^2}$$

$$162x^2 = 288y^2$$

$$\frac{4}{3} = \frac{9}{12} = \frac{3}{4}$$

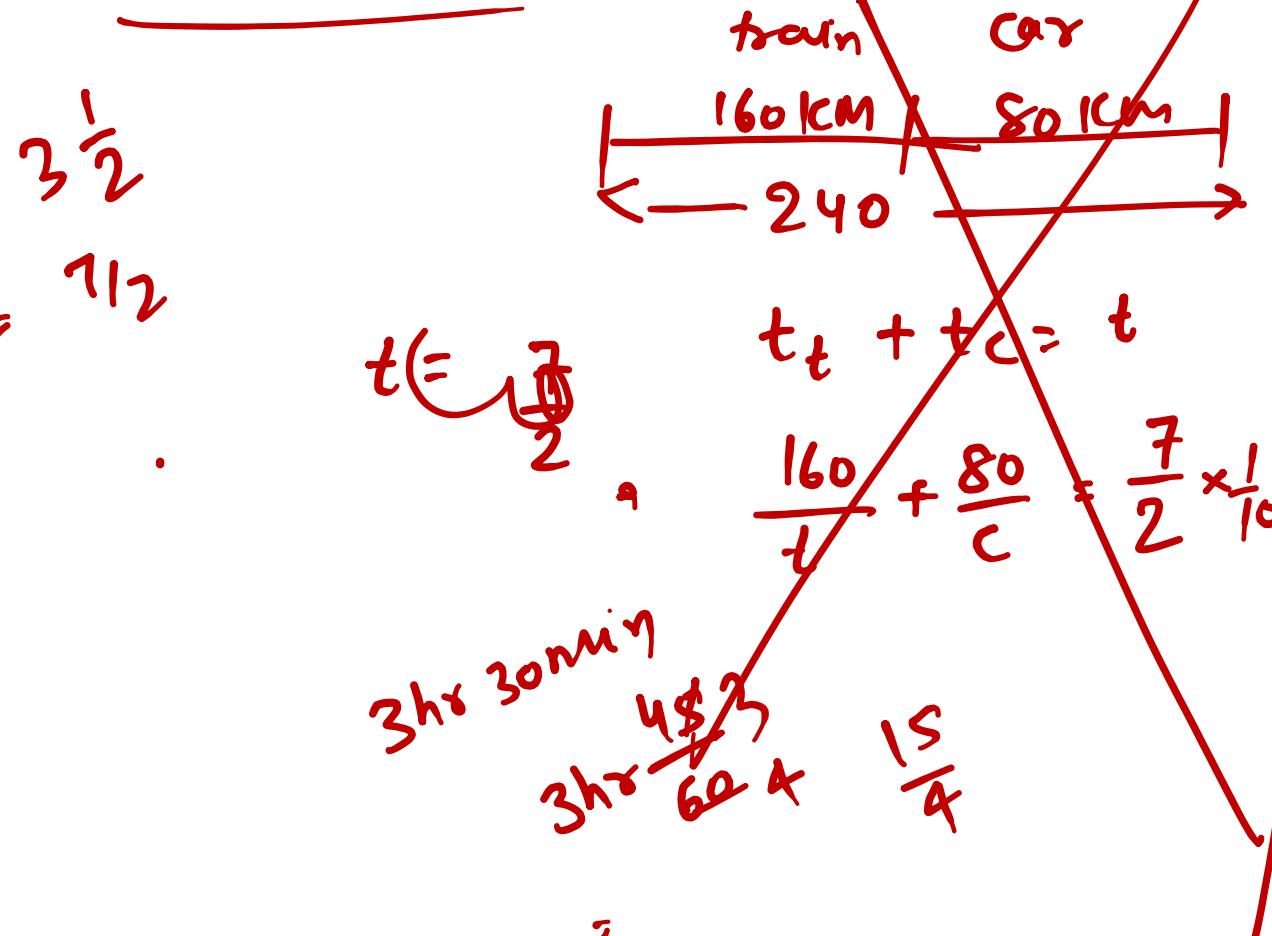
$$\frac{81}{144} \frac{162}{288} =$$

$$\frac{9^2}{12^2} \frac{y^2}{x^2}$$

$$\frac{37}{59}$$

TEST SERIES DISCUSSION-1

Q15. A man travels 240km partly by train and partly by car. If he covers 160km by the train and rest by the car, it will take 3 hours 30minutes. But if he travels 100km by the train and the rest by the car. It will take 15minutes more. What is the speed of the train.



$$\frac{100}{t} + \frac{940}{c} = \frac{15}{4} \times \frac{1}{10}$$

$$\frac{16}{t} + \frac{8}{c} = \frac{7}{20} \times \frac{2}{2} = \frac{14}{40}$$

$$\frac{10}{t} + \frac{14}{c} = \frac{15}{40}$$

$$\frac{112}{t} \neq \frac{98}{40}$$

$$\frac{40}{t} = \frac{60}{40}$$

$$72t = \frac{38}{40} \times 20$$

$$t = \frac{72 \times 20}{19} = \underline{\underline{75 \text{ km/hr}}}$$

TEST SERIES DISCUSSION-1

Q16. Santa wants to gift a stationery kit, which includes a pencil, an eraser, and a sharpener, to some kids in her village. She went to a wholesaler to purchase these items. The seller sells pencils in packs of 12, erasers in packs of 18, and sharpeners in packs of 10. She purchases the minimum number of packs of pencils, erasers, and sharpeners so that a fixed number of kits can be prepared without any item being unused or short. What is the number of packs of pencils purchased by her? .

TEST SERIES DISCUSSION-1

Q17. The ratio of income of two persons A and B is $1/9 : 1/13$ and the ratio of their expenditure is $1/5 : 1/7$. If person A saves Rs.5000 and person B saves Rs.3000 per month. What is the sum of their monthly incomes?

$$13x9=117 \rightarrow I_A : I_B = \frac{1}{9} : \frac{1}{13} = \left[\frac{117}{9} : \frac{117}{13} = 13 : 9 \right] = \boxed{\begin{matrix} 13x, 9x \\ 7y, 5y \end{matrix}} \checkmark$$
$$E_A : E_B = \frac{1}{5} : \frac{1}{7} = \left[\frac{35}{5} : \frac{35}{7} = 7 : 5 \right] = \boxed{\begin{matrix} 7y, 5y \\ 13x, 9x \end{matrix}} \checkmark$$

$$\boxed{100 - 20 = 80}$$

$$S_A = 13x - 7y = 5000 \times 5$$

$$S_B = 9x - 5y = 3000 \times 7$$

$$\begin{aligned} 22x &= 22 \times 2000 \\ &\approx 44000 \\ 63x &= 25000 \\ 63x &= 21000 \\ 2x &= 4000 \end{aligned}$$

TEST SERIES DISCUSSION-1

Q18. Mr.Raju lent out a certain sum on S.I and the same sum on C.I at a certain rate of interest p.a. If the ratio between the difference of C.I and S.I of 2 years and 3 years is 10 : 31, what is the rate of interest p.a??

(10.1)

$$(C.I - S.I)_3 = \frac{P\gamma^2(300+\gamma)}{100^3}$$
$$\Rightarrow \frac{10^2}{100^2} \times \frac{100\gamma}{28(300+\gamma)} = \frac{10}{31}$$
$$310 = 300 + \gamma$$
$$\boxed{\gamma = 10.1}$$

$$(C.I - S.I)_2 = \frac{P\gamma^2}{100^2}$$

TEST SERIES DISCUSSION-1

Q19.

If $\frac{\sqrt{7} + \sqrt{5}}{\sqrt{7} - \sqrt{5}} = a - b\sqrt{35}$, then the value $a - 2b$ is

$$\frac{\sqrt{7} + \sqrt{5}}{\sqrt{7} - \sqrt{5}} \times \frac{\sqrt{7} + \sqrt{5}}{\sqrt{7} + \sqrt{5}} = \frac{7+5+2\sqrt{35}}{7-5}$$
$$= \frac{12+2\sqrt{35}}{2}$$

$a = 6, b = -1$

$$a - 2b = 6 - 2 \times (-1) = 6 + 2 = 8$$

TEST SERIES DISCUSSION-1

Q20. The sum of two numbers is 2604 and their HCF is 124. Which is the smaller between them if their difference is the least possible?

$$\begin{array}{c} 10 \\ 15 \end{array} \quad \begin{array}{c} 15 \times 2 \\ 5 \times 3 \end{array}$$

HCF = 5

$$\begin{array}{l} 1^{\text{st}} : 5 \times 2 \checkmark \\ 2^{\text{nd}} : 5 \times 3 \checkmark \end{array}$$

$$\begin{array}{c} 124 \\ 2480 \end{array}$$

$$\begin{array}{c} 2480 \\ 124 \\ 2256 \end{array}$$

$$\begin{array}{c} 1+20= \\ 2+19= \\ 10+11=1 \end{array}$$

$$\underline{\text{HCF} = 124}$$

$$\left. \begin{array}{l} 1^{\text{st}} = 124 \times x \\ 2^{\text{nd}} = 124 \times y \end{array} \right\} = 124 \times 10 = 1240$$
$$= 124 \times 11 = 1364$$

$$\boxed{124} \checkmark$$

$$124x + 124y = 2604$$

$$x+y = \frac{2604}{124} = 21$$

$$x+y = 21$$