UDAAN

2026

Pair of Linear Equation in Two Variables

MATHS LECTURE-8

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Topics *to be covered*

A Word Problems Part-4

Cost price = 110

10% → Profit

Selling price =

10% of 110 + 110

$\frac{10}{100} \times 110 + 110$

$= 11 + 110$

$= 121$

C.P = x

Profit = 12%

Selling price = $x + 12\%$ of x

$= x + \frac{12}{100} \times x = x + \frac{3x}{25}$

$= \frac{28x}{25}$

C.P = y

Profit = 8%

S.P = 8% of $y + y$

$= \frac{8}{100} \times y + y = \frac{27y}{25}$

#Q. Jamila sold a table and a chair for ₹ 1050, thereby making a profit of 10% on a table and 25% on the chair. If she had taken a profit of 25% o the table and 10% on the chair she would have got ₹ 1065. Find the cost price of each.

S.P

let the cost price of a table be 'x' Rs.
" " " " " chair be 'y' Rs.

Total SP = 1050

$\frac{11}{10}x + \frac{5}{4}y = 1050$

$\frac{22x+25y}{20} = 1050$

$22x+25y = 21000$ — (1)

Case-I

S.P of table = $x + 10\%$ of x

$= x + \frac{10}{100}x$

$= \frac{110x}{100}$

$= \boxed{\frac{11}{10}x}$

S.P of chair = $y + 25\%$ of y

$= y + \frac{25}{100} \times y$

$= \frac{125y}{100}$

$= \boxed{\frac{5}{4}y}$

Case-II

Table

$C.P = x$

$P = 25\%$

$S.P = x + 25\%\ of\ x$

$= x + \frac{25}{100}x$

$= \frac{125x}{100}$

$= \boxed{\frac{5}{4}x}$

Chair

$C.P = y$

$P = 10\%$

$S.P = y + 10\%\ of\ y$

$= y + \frac{10}{100}y$

$= \frac{110y}{100}$

$= \boxed{\frac{11}{10}y}$

Total S.P = 1065

$\frac{5}{4}x + \frac{11}{10}y = 1065$

$\frac{25x + 22y}{20} = 1065$

$25x + 22y = 21300$ — (2)

$22x + 25y = 21000$ — (1)

Ans: C.P of table = ₹ 500

C.P of chair = ₹ 400

Invest = 1000 RS

Interest = 5% → 1 year

After 1 year = Interest

$= 5\% \text{ of } 1000$

$= \frac{5}{100} \times 1000$

$= 50$

total money = 1000 + 50

= 1050

In = 50000

Interest = 12% → 1 year

$\text{Interest} = 12\% \text{ of } 50000$

$= \frac{12}{100} \times 50000$

$= 6000$

#Q. Susan invested certain amount of money in two schemes A and B, which offer interest at the rate of 8% per annum and 9% per annum, respectively. She received ₹ 1860 as annual interest. However, had she interchanged the amount of investment in the two schemes, she would have received ₹ 20 more as annual interest. How much money did she invest in each scheme?

Ans: ₹12000, ₹ 10000

total interest = 1860

$$8\% \text{ of } x + 9\% \text{ of } y = 1860$$

$$\frac{8x}{100} + \frac{9y}{100} = 1860$$

$$8x + 9y = 186000 \quad (1)$$

total interest = 1880

$$8\% \text{ of } y + 9\% \text{ of } x = 1880$$

$$\frac{8y}{100} + \frac{9x}{100} = 1880$$

$$8y + 9x = 188000 \quad (2)$$

1C = 1RS

11C = 11RS

1 'C' = 50 'RS'

12 'C' = (12 × 50) RS

= 600 RS

2RS = 3 choclate.

$\frac{2}{3}$ RS = 1 choclate.

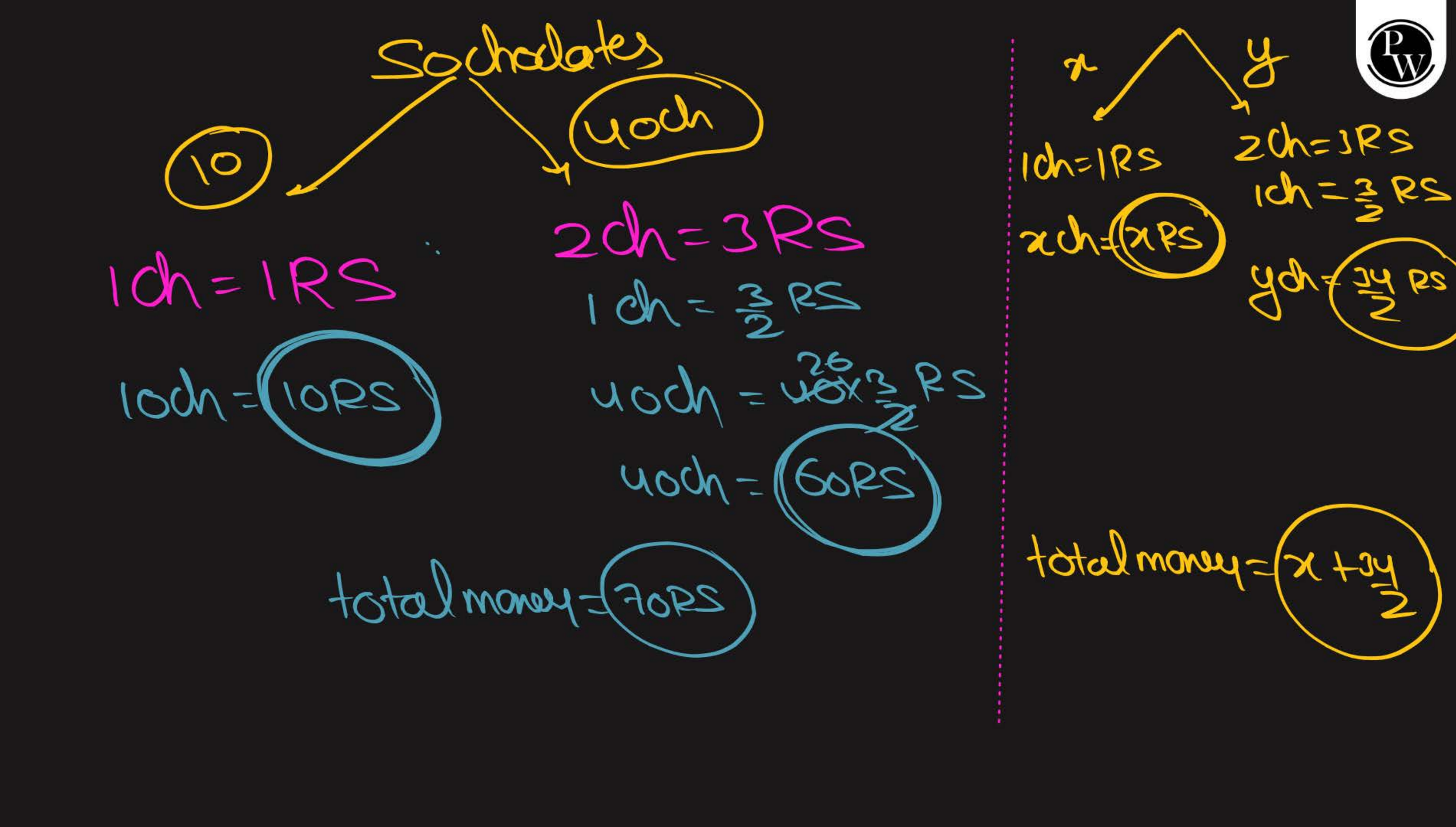
4 RS = 5 choclate.

$\frac{4}{5}$ RS = 1 choclate

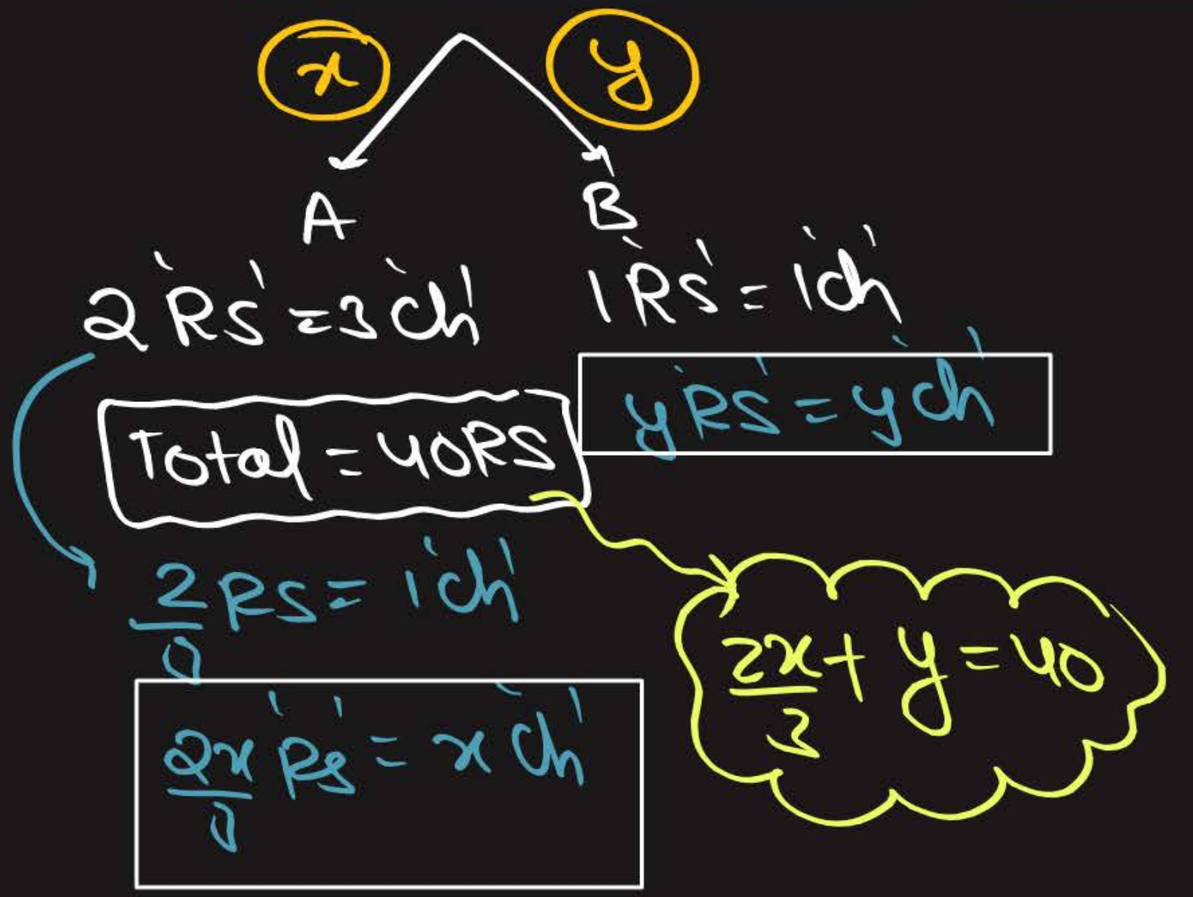
$\frac{8}{5}$ 'RS' = 2 'ch'

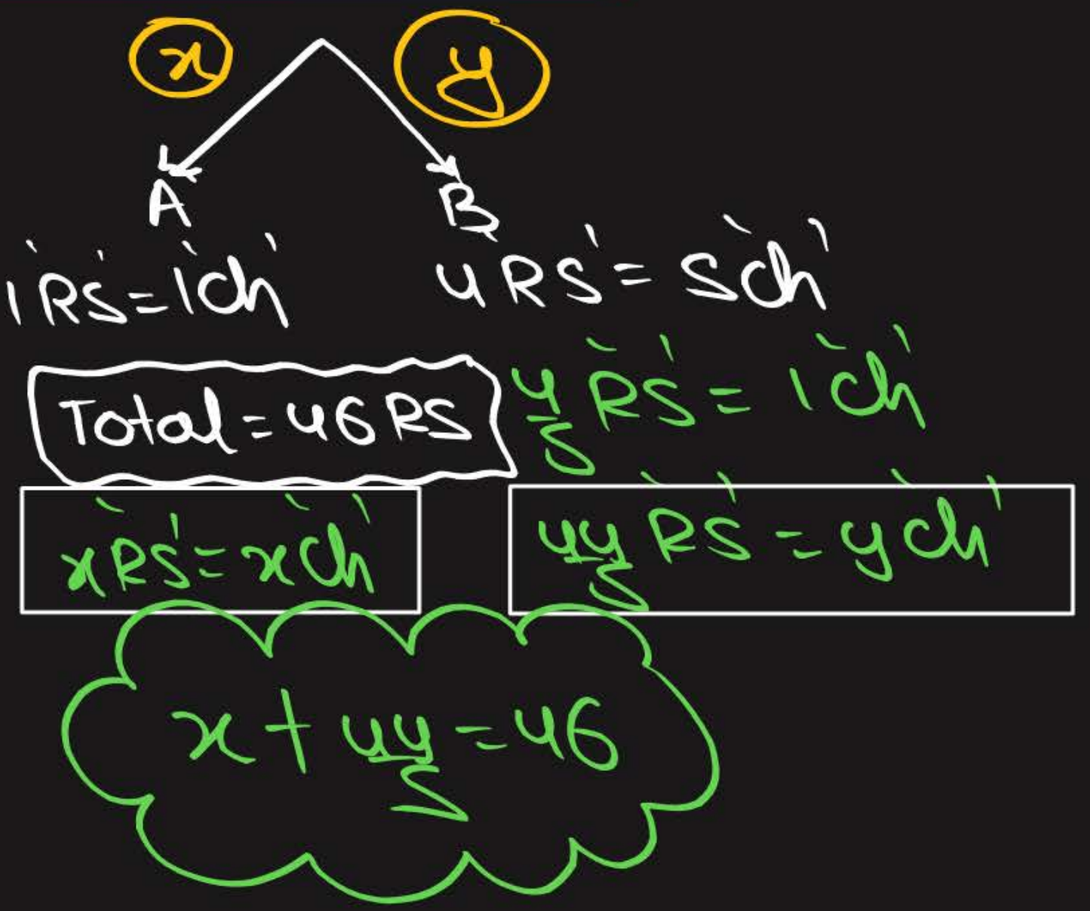
$\frac{12}{5}$ 'RS' = 3 'ch'

$\frac{4x}{10}$ 'RS' = x 'ch'


50 chocolates
10
40ch
1ch = 1RS
2ch = 3RS
1ch = 3/2 RS
10ch = 10RS
40ch = 40 x 3/2 RS
40ch = 60RS
total money = 70RS
x
y
1ch = 1RS
xch = xRS
2ch = 3RS
1ch = 3/2 RS
ych = 3y/2 RS
total money = x + 3y/2

#Q. Anu had some chocolates, and he divided them into two lots A and B. He sold the first lot at the rate of ₹2 for 3 chocolates and the second lot at the rate of ₹1 per chocolate, and got a total of ₹40. If he had sold the first lot at the rate of ₹1 per chocolate, and the second lot at the rate of ₹4 for 5 chocolates, his total collection would have been ₹46. Find the total number of chocolates he had.



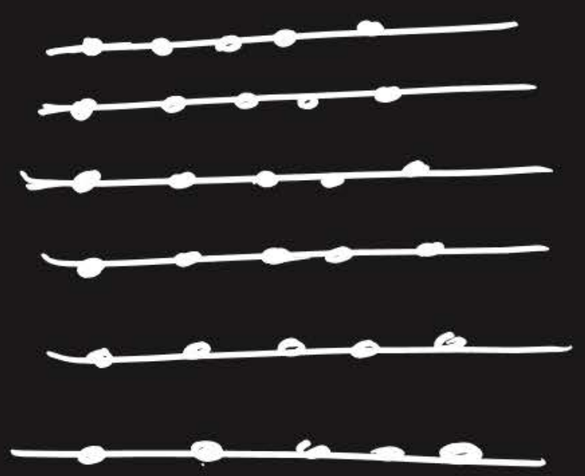


#Q. Vijay had some bananas and he divided them into two lots A and B. He sold the first lot at the rate of RS. 2 for 3 bananas and the second lot at the rate of Rs 1 per banana and got a total of Rs. 400. If he had sold the first lot at the rate of Rs. 1 per banana and the second lot at the rate of Rs.4 for 5 bananas, his total collection would have been Rs 460. Find the total number of bananas he had.

#GaPk

Ans: 500

$x = 300$
$y = 200$



Total students = no. of rows × no. of students in each row.

no. of rows = x

no. of students in each row = y

total students = xy

no. of rows = $x+1$

no. of students in each row = $y-1$

total students = $(x+1)(y-1)$

$= xy - x + y - 1$ //

#Q. Students of a class are made to stand in rows. If one student is extra in each row, there would be 2 rows less. If one student is less in each row there would be 3 rows more. Find the number of students in the class.

let no. of students in each row = x

let no. of rows = y.

total students = xy

I

$x+1$

$y-2$

total students $= (x+1)(y-2)$

$xy = xy - 2x + y - 2$

$0 = -2x + y - 2$ ①

II

$x-1$

$y+3$

total 's' $= (x-1)(y+3)$

$xy = xy + 3x - y - 3$

$0 = 3x - y - 3$ ②

$l = x$

$b = y$

$A = xy$

$l' = x+1$

$b' = y+2$

$A' = (x+1)(y+2)$

$xy+10$

$l'' = x+2$

$b'' = y-3$

$A''' = (x+2)(y-3)$

$xy+89$

#Q. In a rectangle, if the length is increased by 3 metres and breadth is decreased by 4 metres, the area of the rectangle is reduced by 67 square metres. If length is reduced by 1 metre and breadth is increased by 4 metres, the area is increased by 89 sq. metres. Find the dimensions of the rectangle.

Let,

(l) length = x

(b) breadth = y

(A) Area = xy

Case-I

$l' = x+3$

$b' = y-4$

$A' = (x+3)(y-4)$

$xy - 67 = (x+3)(y-4)$

Case-II

$l'' = x-1$

$b'' = y+4$

$A'' = (x-1)(y+4)$

$xy + 89 = (x-1)(y+4)$

#Q. Teachers and students of class X of a school had gone to Nandan Kannan for study tour. After visiting different places of Nandan Kannan, lastly, they visited bird's sanctuary and deer park. Rohan is a clever boy and keen observer. He put the question to his friends, "How many birds are there and how many deer are there (at particular time) in Nandan Kannan?" Rahul's friend, Nishith gave the correct answer as follows:
'Nishith answered that total animals have 1000 eyes and1400 legs.'

Let no of birds = x
Let no of deer = y

no of eyes of birds = 2x
" " " " deer = 2y

total eyes = 2x + 2y

1000 = 2x + 2y

500 = x + y

no of legs of birds = 2x
" " " " deer = 4y

total legs = 2x + 4y

1400 = 2x + 4y

1400 = 2(x + 2y)

700 = x + 2y

Based on the above, answer the following questions:

(i) If x and y be the number of birds and deer respectively, what is the equation of total number of eyes?

(a) $x + y = 1000$ (b) $x + y = 500$ (c) $x - y = 1000$ (d) $x - y = 500$

(ii) What is the equation of total number of legs?

(a) $2x + y = 70$ (b) $x + 2y = 500$ (c) $x + 2y = 700$ (d) $2x - y = 500$

(iii) How many birds are there in the Zoo?

(a) 1000 (b) 5000 (c) 300 (d) 200

(iv) How many deer are there in the zoo?

(a) 500 (b) 200 (c) 300 (d) 700

(v) Total number of animals (birds and deer) is:

(a) 1000 (b) 700 (c) 500 (d) 300

#Q. A coaching institute of Mathematics conducts classes in two batches I and II and fees for rich and poor children are different. In batch I, there are 20 poor and 5 rich children, whereas in batch II, there are 5 poor and 25 rich children. The total monthly collection of fees from batch I is ₹9,000 and from batch II is ₹26,000. Assume that each poor child pays x per month and each rich child pays y per month.

B-I

20 poor 5 Rich

1P = x Rs 1R = y Rs

20P = 20x Rs 5R = 5y Rs

$20x + 5y = 9000$

B-II

5 poor 25 rich

$5x + 25y = 26000$

#Gapu

Based on the above, answer the following questions:

(i) Represent the information given above in terms of x and y.

(ii) Find the monthly fee paid by a poor child.

(iii) Find the difference in the monthly fee paid by a poor child and a rich child.

(iv) If there are 10 poor and 20 rich children in batch II, what is the total monthly collection of fees from batch II.

#Q. A test consists of 'True' or 'False' questions. One mark awarded for every correct answer while 1/4 mark is deducted for every wrong answer. A student knew answers to some of the questions. Rest of the questions he attempted by guessing. He answered 120 questions and scored 95 marks.

no. of right answers = x

no. of guessed answers = y

total questions = $x+y$

$x+y=120$ (1)

(1) $x \times 1 - y \times \frac{1}{4} = 95$

$x - \frac{y}{4} = 95$

$\frac{4x-y}{4} = 95$

$4x-y=380$ (1)

$x+y=120$

$+\quad 4x-y=380$

$5x=500$

$x=100$

Based on the above, answer the following questions:

(i) If answer to all questions he attempted by guessing were wrong, then the number of questions he answered correctly is

(a) 24 (b) 96 (c) 100 (d) 90

(ii) The number of questions he guessed, is

(a) 24 (b) 96 (c) 20 (d) 90

(iii) If answer to all questions he attempted by guessing were wrong and answered 80 correctly, then how many marks he got?

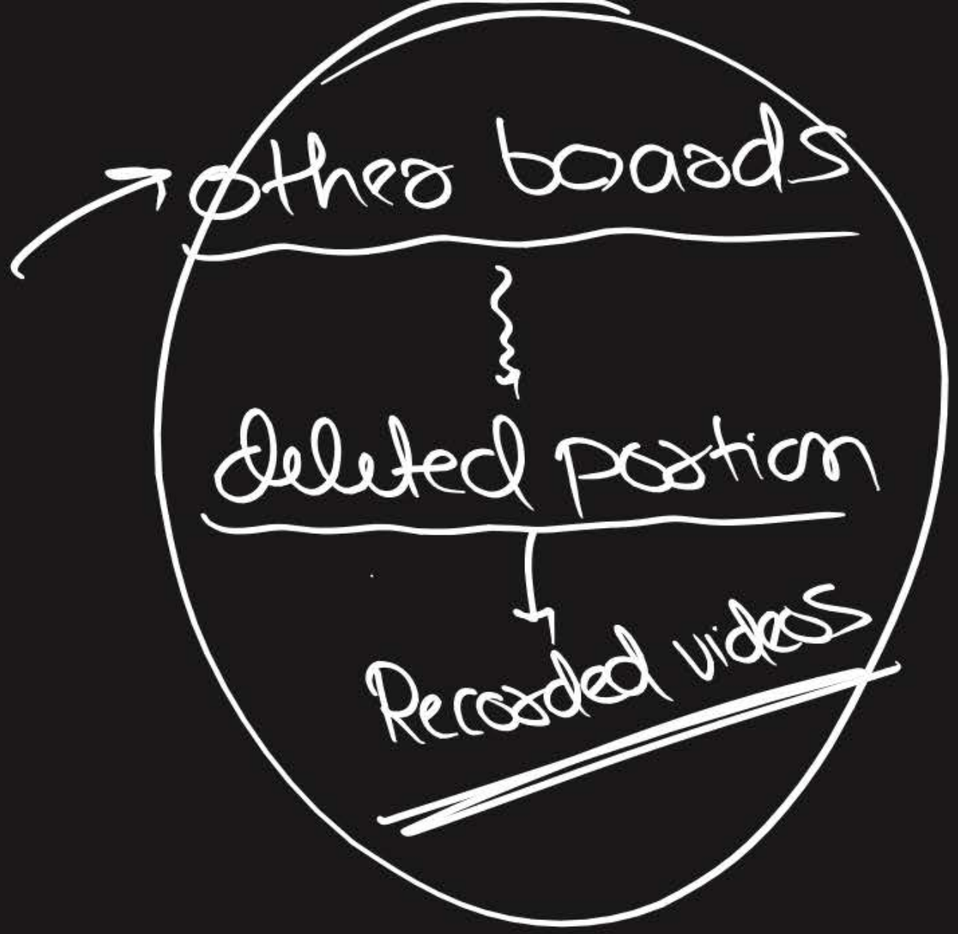
(a) 40 (b) 45 (c) 70 (d) 35

120 → 80
40

$= 80 \times 1 - 40 \times \frac{1}{4}$

$= 80 - 10$

guess/wrong = 70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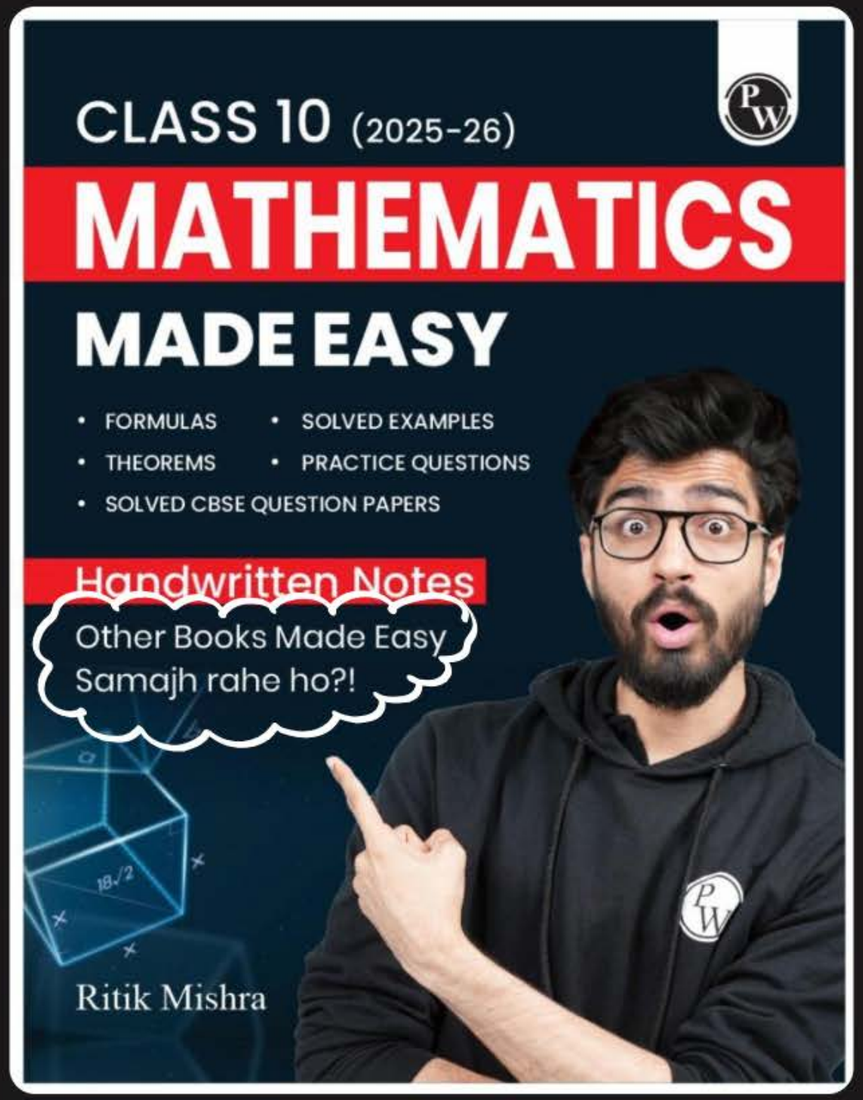
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