



# MATHS

## BOOKS - ICSE

# SIMULTANEOUS LINEAR EQUATIONS IN TWO VARIABLES

### Topic 1 3 Marks Questions

1. Solve the following pair of linear (simultaneous) equations using method of

substitution :

$$6x = 7y + y$$

$$7y - x = 8$$



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2. Solving  $1.5x + 0.1y = 6.2$  and

$3x - 0.4y = 11.2$  by substitution method.



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3. Solve the following using method of by substitution

$$\frac{3x}{2} - \frac{5y}{3} + 2 = 0$$

$$\frac{x}{3} + \frac{y}{2} = 2. \frac{1}{6}$$



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4. Solve the following pair of linear equations using method of elimination by equating coefficients .

$$\frac{x-y}{6} = 2(4-x)$$

$$2x + 4 = 3(x - 4)$$



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5. Solve the linear equations by elimination method

$$41x + 53y = 135$$

$$53x + 41y = 147$$



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6. If  $10y = 7x - 4$  and  $12x + 18y = 1$ . Find the value of  $4x + 6y$  and  $8y - x$ .



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7. Solve , Using cross multiplication method

$$4x - y = 5$$

$$5y - 4x = 7$$



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8. Solve the linear equations using cross multiplication method.

$$0.4x - 1.5y = 6.5$$

$$0.3x + 0.2y = 0.9$$



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9. Solve :  $\frac{3}{x} - \frac{2}{y} = 0$  and  $\frac{2}{x} + \frac{5}{y} = 19$  .

Hence , find 'a' if  $y = ax + 3$



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10. Solve :  $x + y = 7xy$   
 $2x - 3y = -xy$



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11. Solve following pairs of linear equations using cross-multiplication method :

$$5x - 3y = 2$$

$$4x + 7y = -3$$



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**12.** Solve the following pair of linear equations using cross multiplication method :

$$2x - 5y = 14$$

$$x + 2y = -2$$



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**Topic 1 4 Marks Questions**

1. Solve the following pair of linear (simultaneous) equation using method of substitution.

$$\left. \begin{aligned} \frac{2x+1}{7} + \frac{5y-3}{3} &= 12 \\ \frac{3x+2}{2} - \frac{4y+3}{9} &= 13 \end{aligned} \right) \therefore \}$$



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2. Solve for x and y :

$$\frac{y+7}{5} = \frac{2y-x}{4} + 3x - 5$$

$$\frac{7-5x}{2} + \frac{3-4y}{6} = 5y - 18$$



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3. Solve 10 % of  $x$  + 20 % of  $y = 24$

$$3x - y = 20$$



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4. The value of expression  $mx - ny$  is 3 when  $x = 5$  and  $y = 6$ . And its value is 8 when  $x = 6$  and  $y = 5$ . Find the values of  $m$  and  $n$ .



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## 5. Solve using cross-multiplication

$$\sqrt{2}x - \sqrt{3}y = 0$$

$$\sqrt{5}x + \sqrt{2}y = 0$$



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6. Solve :

$$\frac{34}{3x+4y} + \frac{15}{3x-2y} = 5$$
$$\frac{25}{3x-2y} - \frac{8.50}{3x+4y} = 4.5$$



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7. Solve :

$$\frac{a}{x} - \frac{b}{y} = 0$$
$$\frac{ab^2}{x} + \frac{a^2b}{y} = a^2 + b^2$$



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8. Solve :

$$\frac{2xy}{x+y} = \frac{3}{2}$$
$$\frac{xy}{2x-y} = -\frac{3}{10}$$

$$x + y \neq 0 \text{ and } 2x - y \neq 0$$



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## Topic 2 3 Marks Questions

1. Two numbers are in the ratio 4:7 . If thrice the larger be added to twice the smaller, the

sum is 59. Find the numbers.



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2. The sum of two positive numbers  $x$  and  $y$  ( $x > y$ ) is 50 and the difference of their squares is 720. Find the numbers.



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3. A fraction becomes  $\frac{1}{2}$  if 5 is subtracted from its numerator and 3 is subtracted from

its denominator . If the denominator of this fraction is 5 more than its numerator. Find the fraction.



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4. Four times a certain two digit number is seven times the number obtained on interchanging its digits. If the difference between the digits is 4, find the number



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5. A two digit number is obtained by multiplying the sum of the digits by 8. Also, it is obtained by multiplying the difference of the digits by 14 and adding 2. Find the number.



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6. Five years ago, A's age was four times the age of B. Five years hence, A's age will be twice the age of B. Find their present ages.



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7. The annual incomes of A and B are in the ratio 3:4 and their annual expenditures are in the ratio 5: 7. If each saves 5,000, find their annual incomes.



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8. 1250 Persons went to see a circus-show. Each adult paid 75rs and each child paid 25rs for the admission ticket. Find the number of

adults and number of children, if the total collection from them amounts to 61250*rs*.



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9. Pooja and Ritu can do a piece of work in  $17\frac{1}{7}$  days. If one day work of Pooja be three fourth of one day work of Ritu. Find in how many days each will do the work alone.



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**10.** The area of a rectangle gets reduced by 9 square units if its length is reduced by 5 units and the breadth is increased by 3 units. If we increase the length by 3 units and breadth by 2 units, the area is increased by 67 square units. Find the length and breadth of the rectangle.



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11. Mr. Mohan has 256rs in the form of 1rs and 2rs coins. If the number of 2rs coins are three more than twice the number of 1rs coins find the total value of 2rs coins



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12. If 1 is subtracted from the numerator of a fraction it becomes  $\frac{2}{3}$ , but if 5 is added to the denominator of the fraction it becomes  $\frac{1}{2}$ . Find the fraction ?





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## Topic 2 4 Marks Questions

1. When the greater of the two numbers increased by 1 divides the sum of the numbers, the result is  $\frac{3}{2}$ . When the difference of these numbers is divided by the smaller, the result is  $\frac{1}{2}$ . Find the numbers .



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2. If the numerator of a fraction is multiplied by 2 and its denominator is increased by 1, it becomes 1. However, if the numerator is increased by 4 and denominator is multiplied by 2, the fraction becomes  $\frac{1}{2}$ . Find the fraction.



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3. A two digit number is such that the ten's digit exceeds twice the unit's digit by 2 and

the number obtained by interchanging the digits is 5 more than three times the sum of the digits . Find the two digits number.



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4. The age of a man is twice the sum of the age of his two children . After 20 years his age will be equal to the sum of the age of his children, at that time. Find the present age of the sum.



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5. Two articles A and B are sold for 1,167 making 5% profit on A and 7% profit on B. If the two articles are sold for 1,165, a profit of 7% is made on A and a profit of 5% is made on B. Find the cost price of each article.



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6. The sum of digits of a two digit number is 11. If the digit of ten's place is increased by 5 and the digit at unit's place is decreased by 5 the

digit of the number are found to be reversed.

Find the original number.



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7. The taxi charges in a city consist of a fixed charge together with the charge for the distance covered. For a distance of 10 km, the charge paid is  $315rs$  and for a journey of 15km, the charge paid is  $465rs$ . What are the fixed charges and the charge per kilometre ? How

much does a person have to pay for travelling a distance of  $32\text{km}$  ?



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8. It takes 12 hours to fill a swimming pool using two pipes. If the pipe of larger diameter is used for 4 hours and the pipe of smaller diameter is used for 9 hours, only half of the pool is filled. How long would each pipe take to fill the swimming pool ?



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