

ATOMIC ENERGY EDUCATION SOCIETY

CLASS:X

MATHEMATICS

3.Pair Of Linear Equations In Two
Variables(Module 4)

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AECS 4 RBT

Algebraic Methods of Solving a Pair of Linear Equations(Elimination Method) & some special cases

- In this type of solution we will follow the following steps
- Step 1 : First multiply both the equations by some suitable non-zero constants to make the coefficients of one variable (either x or y) numerically equal.
- Step 2 : Then add or subtract one equation from the other so that one variable gets eliminated. If you get an equation in one variable, go to Step 3.
- If in Step 2, we obtain a true statement involving

- Let us take word problem 1
- The ratio of incomes of two persons is 9 : 7 and the ratio of their expenditures is 4 : 3. If each of them manages to save Rs.2000 per month, find their monthly incomes.
- Solution : Let us denote the incomes of the two person by Rs.9x and Rs.7x and their expenditures by Rs.4y and Rs.3y respectively. Then the equations formed in the situation is given by :
- $9x - 4y = 2000$ (1)
- and $7x - 3y = 2000$ (2)

Q1. A. Multiply Equation (1) by 3 and Equation (2) by 4. Subtract the two equations to get

- Let us take word problem 2
- Use elimination method to find all possible solutions of the following pair of linear equations :

- $2x + 3y = 8$ (1)

- $4x + 6y = 7$ (2)

- Solution :

- Step 1 : Multiply Equation (1) by 2 and Equation (2) by 1 to make the coefficients of x equal.

Then we get the equations as:

- $4x + 6y = 16$ (3)

- $4x + 6y = 7$ (4)

- Problem 3
- The sum of a two-digit number and the number obtained by reversing the digits is 66. If the digits of the number differ by 2, find the number. How many such numbers are there?
- Solution : Let the ten's and the unit's digits in the first number be x and y , respectively.
- So, the first number may be written as $10x + y$ in the expanded form (for example, $56 = 10(5) + 6$).
- When the digits are reversed, x becomes the unit's digit and y becomes the ten's digit. This number, in the expanded notation is $10y + x$ (for

Special Case

- Solve for x & y
- $47x+31y=63$ (1)
- $31x+47y=15$ (2)
- Note that the coefficient of x & y in one equation are interchanged in the other.
- To solve such type of equation we will follow the following steps
- Step 1: Adding equation (1) & (2) we get
- $78x+78y=78$
- Step 2: Dividing both sides by 78 to form a linear equation in simple form as given below
- $x+y=1$ (3)
- Step 3: Subtracting equation (2) from (1), we get $16x-16y=48$
- Step 4: Dividing both sides by 16 we get $x-y=3$ (4)
- Step 5: adding equation (3) & (4) we get
- $x+y+x-y=1+3$ i.e. $2x=4$ which implies that $x=2$
- Step 6: putting $x=2$ in equation (3)

Thank You