Algebraic Methods of Solving a Pair of Linear Equations

Created: Tuesday, 19 July 2011 10:04 | Published: Tuesday, 19 July 2011 10:04 | Written by Super User |
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Pair of linear equations

The pair of the linear equation is in the following form-

$$a_1x + b_1y + c_1 = 0$$

$$\text{and} \quad a_2x + b_2y + c_2 = 0$$

The most commonly used algebraic methods of solving a pair of linear equations in two variables are –

- o Substitution method
- o Elimination method
- o Cross Multiplication method

Elimination Method

In this method, we eliminate one of the two variables to obtain an equation in one variable which can easily be solved. Putting the value of this variable in any one of the given equations, the value of the other variable can be obtained.

Here are the steps which we follow while solving a pair of linear equations by elimination method:

Step I – Obtain the two equations.

Step II – Multiply the equations so as to make the coefficients of the variable to be eliminated equal.

Step III – Add or subtract the equations obtained in step II according as the terms having the same coefficients are of opposite or of the same sign.

Step IV – Solve equation in one variable obtained in step III.

Step V – Substitute the value found in step IV in any one of the given equations and find the value of the other variable.

The values of the variables in step IV and V constitute the solution of the given system of equations.

To get a more clear idea, let's explain with an example:

Example:Solve the following system of equations by using the method of elimination:

3x + 2y = 11   **… (i)**

2x + 3y = 4   **… (ii)**

Let's eliminate from the given equations. The coefficients of y in the given equations are 2 and 3 respectively. The L.C.M. of 2 and 3 is 6. So, we make the coefficients of y equal to 6 in the two equations.

Multiplying (i) by 3 and (ii) by 2, we get

9x + 6y = 33   … (iii)

4x + 6y = 8   … (iv)

Subtracting (iv) from (iii), we get 5x = 25

x = 5

Substituting x = 5 in (i), we get

15 + 2y = 11

2y = -4

y = -2

Hence, the solution of the given system of equations is x = 5 and y = -2.

Try these questions now:

1. Solve the following system of equations by using the method of elimination:

8x + 5y = 9

3x + 2y = 4

(Answer: x = -2 and y = 5)

2. Solve the following system of equations by using the method of elimination:

11x + 15y = -23

7x – 2y = 20

(Answer: x = 2 and y = -3)

Now try it yourself! Should you still need any help,click here to schedule live online session with e Tutor!

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Reference Links :

- http://en.wikipedia.org/wiki/Linear_equation
- http://en.wikipedia.org/wiki/Variable
- http://wiki.answers.com/Q/How_do_you_use_the_elimination_method_using_x_and_y
- http://en.wikipedia.org/wiki/Coefficient

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