# Answer on Question#43683 – Math – Abstract Algebra

**Question:**

Solve the following system of equations, state the method that you would use, and show all work to solve:

$$5x - 3y = -4$$
$$3x - y = -4$$

$$x + 5y = 12$$
$$5x + 25y = 12$$

$$x + y = -2$$
$$-3x - 3y = 6$$

**Solution.**

To solve the first system we will use the substitution method.

From second equation we have: y=3x+4. Substituting it in the first equation we get :

$$5x-3(3x+4)=-4$$

$$5x-9x-12=-4$$

$$-4x=8$$

$$x=-2.$$

And coming back to the first equation we get:

y=3(-2)+4=-2. So, the solution is x=-2, y=-2.

**Answer.** $x = -2, y = -2.$

To solve the second equation let`s use the substitution method again.

From first equation we have: x=12-5y. Substituting it in the second equation we get

$$5(12-5y)+25y=12$$

$$60-25y+25y=12$$

we get 60=12

so, we see that this system has no solution.

**Answer.** No solution.

And to solve the last equation we will use the addition method.

Firstly let's divide the second equation by -3, we get : x+y=-2. Hence, the system is consisting from 2 identical equations. Hence, we get the whole line of solutions y=-2-x.

**Answer.** The solutions are all points which satisfies $y = -2 - x$.