Note Title 9/27/2013

Linear equation w/ variables $x_1\ x_2 \dots x_n$

Can be written:

$$a_1x_1 + a_2x_2 + \cdots + a_nx_n = b$$

$a_1, a_2, \dots$ ← coefficients

n = # of variables.

$$2x_1 - 3x_2 + x_3 = 4.2$$

coeff: $2, -3, 1$.

$2, -3, 1, 4.2$ "constants"

$$2x - 3y + z = 4.2$$

$$x_1 - x_2 + x_1x_2 = 4$$

$$x_1 + \sqrt{x_2} = 5$$

not linear

$$x_1 + \sqrt{2}\,x_3 + x_2 = 4$$ ← linear

$$3x_1 + 4 = x_2 - x_3$$ ← linear.

System of linear equations is a collection of linear equations.

$$x_1 + 2x_2 = 4$$
$$x_1 - x_2 = 1.$$

n = variables
m = # equations.

A solution to a set of linear equations in n variables is an n-tuple

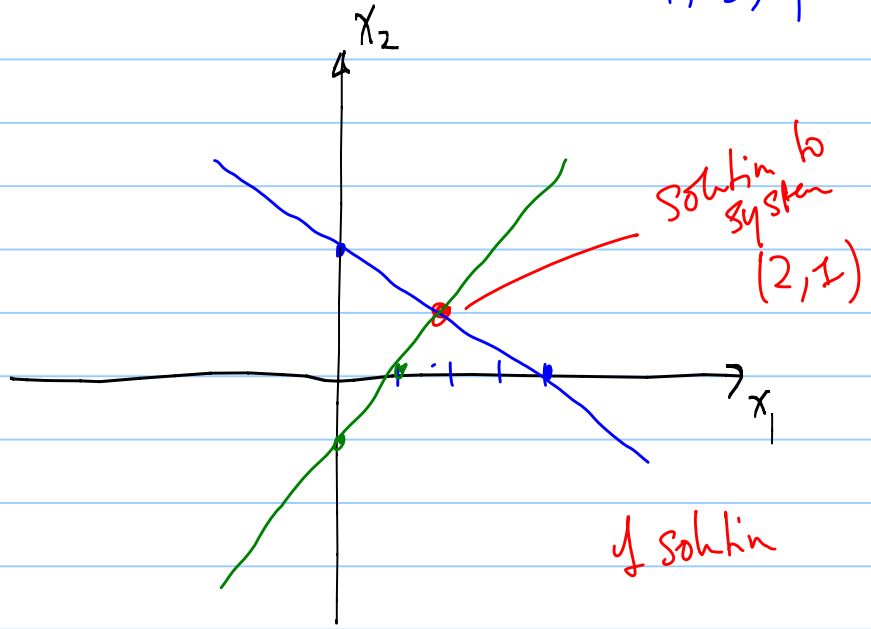
$(s_1, s_2, \ldots, s_n)$ that when substituted for $(x_1, x_2, \ldots, x_n)$ every eqn. is satisfied.

$s_1 = x_1$ ... $s_n = x_n$.

(s_1, s_2) point.

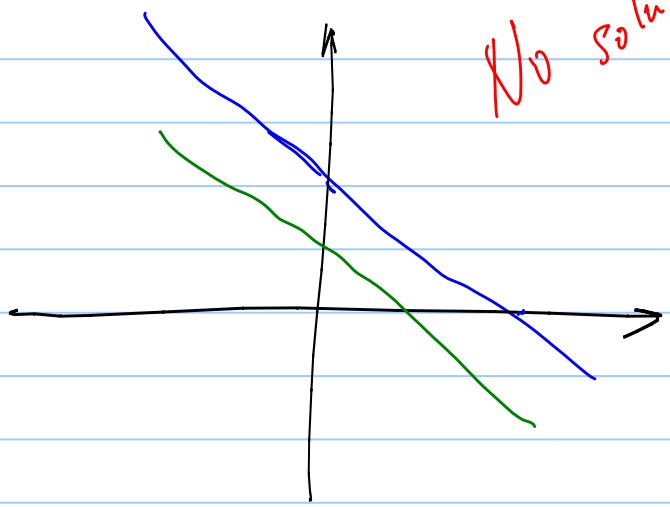
$$x_1 + 2x_2 = 4$$
$$x_1 - x_2 = 1.$$

$x_1 = 2$
$x_2 = 1$



$x_1 + 2x_2 = 4$ •

$2x_1 + 4x_2 = 4$ •



No solutions

$x_1 + 2x_2 = 4$

$2x_2 + 4x_2 = 8$

} infinite # solutions.