

**L2 – Solving Linear Systems by SUBSTITUTION**

Unit 1

MPM2D

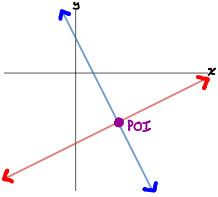
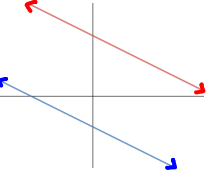
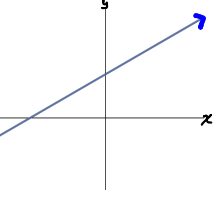
Jensen

Remember that \_\_\_\_\_ a linear system means to find the values of the variables that satisfy ALL of the equations in the system. Graphically speaking, this means you will find the ordered pair  $(x, y)$  where the lines intersect.

There are 3 main methods for solving a linear system:

- 1) Graphing
- 2) Substitution
- 3) Elimination

A linear system could have 1, 0, or infinitely many solutions:

Graph	Slopes of Lines	Intercepts	Number of Solutions	What happens algebraically
Intersecting 				
Parallel & Distinct 				
Parallel & Coincident 				

### Steps for Solving by Substitution:

- 1) Rearrange either equation to isolate a variable ( $x$  or  $y$ )
- 2) Substitute what the isolated variable is equal to into the OTHER equation
- 3) Solve the new equation for the variable
- 4) Plug your answer back in to EITHER original equation to solve for the OTHER variable.
- 5) Check your answer in BOTH equations

**Example 1:** Solve the following systems using the method of substitution

a)  $\ell_1: x + 4y = 6$   
 $\ell_2: 2x - 3y = 1$

b)  $\ell_1: 5x - 3y - 2 = 0$   
 $\ell_2: 7x + y = 0$

**c)**  $\ell_1: 2x + 2y = 7$   
 $\ell_2: x + y = 6$

**d)**  $\ell_1: 3x + 4y = 2$   
 $\ell_2: 9x + 12y = 6$