

SOLVING LINEAR SYSTEMS USING SUBSTITUTION

 Guide Notes

LINEAR SYSTEM OF EQUATIONS: is a set of equations with the same pair of variables. When we are solving systems using the **Substitution Method**, we have to choose one of the equations and solve for one variable (the easiest one) and then plug it into the other equation by substituting the chosen variable and solving for the other.

For two variable systems, there are three possible types: Independent, inconsistent and dependent.

1.
$$\begin{cases} x = 3y - 1 \\ 3x - y = 2 \end{cases}$$

4.
$$\begin{cases} 4x - 3y = 18 \\ y + 2 = 0 \end{cases}$$

2.
$$\begin{cases} -3x + 3y = 4 \\ -x + y = 3 \end{cases}$$

5.
$$\begin{cases} x + y = 4 \\ 5x - 4y = 6 \end{cases}$$

3.
$$\begin{cases} 6x + 2y = 7 \\ y = 1 - 3x \end{cases}$$

6.
$$\begin{cases} 6x - y = 3 \\ 5x - 2y = -8 \end{cases}$$

INDEPENDENT SYSTEM is a system where two distinct non-parallel lines intersect at one specific point (x,y).

Systems:

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INCONSISTENT SYSTEM is a system where two distinct lines are parallel. Since parallel lines never intersect, then there can be no solution.

Systems:

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DEPENDENT SYSTEM is a system which has infinite solutions.

System:

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Sample Problems: Find the solution of the following system by substitution

1.
$$\begin{cases} x + y = 7 \\ 3x - y = -3 \end{cases}$$

2.
$$\begin{cases} 4x - y = 8 \\ x + y = 12 \end{cases}$$

3.
$$\begin{cases} -2x + 2y = 5 \\ -x + y = 4 \end{cases}$$