**SOLVING SYSTEMS ALGEBRAICALLY**

The solution of a system of equations can be solved:

* graphically, or
* ***algebraically*** - either:
  + with the ***substitution method***, or



* + with the *elimination method*.

**SOLVING SYSTEMS OF EQUATIONS WITH THE SUBSTITUTION METHOD**

To solve a system of equations algebraically using The Substitution Method:

1. Solve one of the equations for one of the variables; choose carefully.
2. Take the expression equal to that variable and *substitute* it into the other equation; the result should be a single equation with a single variable.



1. Solve this equation; find the roots - the values of this first variable.



1. *Substitute* each of these roots into an equation with both variables - one at a time; each of these roots will produce an equation with the second variable.
2. Solve these equations; find the value of the second variable.

example: Solve this system of equations BY SUBSTITUTION.

and



Steps:



* Solve for *y* in the linear function



* Substitute expression for *y* into the



quadratic function.



* Solve this quadratic equation.



* Substitute each of these *x-*values



Into the linear function to find the



Corresponding *y*-values.



Could this example be solved with the substitution method using different decisions?



exercise: Solve using The Substitution Method. Find the *exact* values.



*y*  =  *x*2  +  2 and 2*x*  −  *y*  +  1  =  0



*HW: p. 451 #1-3, 8, 13, 14, 19, 22*

Solve by SUBSTITUTION:

1. *y*  =  *x*2  −  4*x*  +  2 and 3*x*  +  2*y*  −  11  =  0
2. *y*  =  (*x* + 1)2  −  4 and *y*  = −2*x*2  +  7
3. *y*  =  *x*2  −  4*x*  +  2 and *x*  −  2*y*  −  8  =  0