**SYSTEMS OF EQUATIONS**

**System of equations**: a collection of **two** or more equations with the same variables.

**Linear-quadratic** system of equations:

**Quadratic-Quadratic** system of equations:

To solve any system of equations, find all values of the variables that *satisfy every equation in the system*.

The solution of a system of equations can be found:

* ***graphically***, or
* algebraically - either by the substitution method or the elimination method.

**SOLVING SYSTEMS OF EQUATIONS BY GRAPHING**

To solve a system of equations graphically:

1. *Graph* each equation on the same coordinate plane.
2. Find all the points that are common to all of the graphs, i.e**. look at the point(s) of intersection!**
3. *Verify* your solutions by substitution.

example: Solve this system of equations graphically.

*y*

*x*

0

-4

4

-4

4

 *y*  =  *x*2  and *y*  =  *x*  +  2

example: Solve this system of equations graphically.

*y*

*x*

0

-4

4

-4

4

 *y*  =  *x*2 -2 and *x - y*  = -4

exercise: How many solutions can a linear-quadratic system have? Illustrate your answers.

exercise: Solve graphically. **Verify your solutions.**

1. *y*  =  *x*2 b) *y*  =  (*x* + 1)2  −  4

$ y=-(x-1)^{2}+5$ *y*  =  -2(*x* + 1)2  −  1

*y*

*x*

0

*-*4

4

-4

4

*y*

*x*

0

*-*4

4

-4

4

exercise: How many solutions can a quadratic-quadratic system have? Illustrate your answer.

**Example**: The difference of two numbers is 2. The square of the smaller number equals the larger. Create a system of equations to describe this scenario and use them to graph a solution to the system in order to find the two numbers.

*y*

*x*

0

-4

4

-4

4

HW: p. 435: #2-4abd, 6-8, 13, 20

DO NOT PRINT

xercise: Solve graphically; round to one decimal place if necessary. **Verify your solutions.**

1. *y*  =  *x*2  −  4*x*  +  2 b) *y*  =  (*x* + 1)2  −  4

 3*x*  +  3*y*  −  6  =  0 *y*  =  -2(*x* + 1)2  −  1

*y*

*x*

0

*-*4

4

-4

4

*y*

*x*

0

*-*4

4

-4

4