**Linear Equations**

A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the variables  has the form



Where  are real or complex numbers.

Circle the linear equations, and state why the non-linear aren’t linear.



A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a collection of one or more linear equations with the same variables. For example



A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a system is a list of numbers  that make every equation of the system true, when each  is substituted for .

Verify that (3,2,1) is a solution to the system .

The set of all possible solutions is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_.

Find another solution to the system from Ex 2.

Two systems are considered \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ if they have the same solution set.

From 2 dimensional systems of equations in algebra, we should remember that there are 3 possibilities for the number of solutions to a system.





A system is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ if it has at least one solution, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ if it has no solutions.

**Matrix Notation**

We will represent a system of equations by its coefficients in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 will be re-written as the

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ matrix

The \_\_\_\_\_\_\_\_\_\_ of a matrix tells
how many \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_
a matrix has. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ matrix

An  matrix has
\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and
\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Solving a Linear System** – We are going to describe an algorithm for solving linear systems, which replaces one system with an equivalent one that is easier to solve. Since they are equivalent, they have the same solution set.

Solve the system Three Operations we can use:





Two matrices are called \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ if there are a sequence of elementary row operations that transform one matrix into the other.

If two systems are row equivalent, they have the same \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_.



Determine whether the systems are consistent or inconsistent. Do not fully solve.



Determine whether the systems are consistent or inconsistent. Do not fully solve.