Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_

**Algebra II (4.3 Exploration): Types of Systems of Linear Equations**

***This exploration involves three types of systems of linear equations. For each type of system, graph each pair of linear equations. Then answer the questions.***

**TYPE 1:**

$\left\{\begin{array}{c}x+2y=5\\3x+2y=7\end{array}\right.$ $\left\{\begin{array}{c}4x+3y=1\\-4x+y=-3\end{array}\right.$ $\left\{\begin{array}{c}-x-2y=5\\-x-3y=4\end{array}\right.$

Which pairs of lines intersect?

How is each pair of equations alike or different? Compare the slopes. How many solutions does each linear system have?

**TYPE 2:**

$\left\{\begin{array}{c}x+y=4\\3x+3y=12\end{array}\right.$ $\left\{\begin{array}{c}x-2y=-6\\-4x+8y=24\end{array}\right.$ $\left\{\begin{array}{c}4x+y=-1\\-12x-3y=3\end{array}\right.$

Which pairs of lines intersect? How many times do they intersect?

How is each pair of equations alike or different? How many solutions does each linear system have?

**TYPE 3:**

$\left\{\begin{array}{c}x-3y=-15\\x-3y=6\end{array}\right.$ $\left\{\begin{array}{c}-2x+y=-3\\-4x+2y=14\end{array}\right.$ $\left\{\begin{array}{c}-x+4y=1\\x-4y=-2\end{array}\right.$

Which pairs of lines intersect?

How is each pair of equations alike or different? What do we call these types of lines? How many solutions does each linear system have?

Describe the three types of systems of linear equations in terms of intersecting lines. Use the terms ***slope and y-intercept***in your description.

Describe what the solution would be for a system of linear equations in which lines have ***different*** slopes but the ***same*** y-intercept.