**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per.\_\_\_\_\_\_\_**

**U9 CW #1** *Solving Systems of Linear Equations by Graphing Part I*

One method for solving simultaneous linear equations is graphing. In this method, both equations are graphed on the same coordinate grid, and the **solution is found at the point where the two lines intersect**.

Consider the simultaneous linear equations shown below and answer the questions that follow:

$$2x+y=4$$

$$y=4x-2$$

1. What problems might you encounter as you try to graph these two equations?

1. What form of linear equations do we typically use when graphing?

As we have seen, it is possible to rearrange an equation that is not in slope-intercept form using the same rules we used when solving equations. We can rearrange this equation to put it in slope-intercept form. Remember, slope-intercept form is the form $y=mx+b$, so our goal here will be to isolate *y* on the left side of the equation, then arrange the right side so that our slope comes first, followed by the *y*-intercept.

$2x+y=4$ Subtract 2*x* from both sides to isolate *y*

$y=4-2x$ (Remember that 4 and $-2x$ are not like terms and cannot be combined)

$y=-2x+4$ Rearrange the right side so that the equation is truly in slope-intercept form

1. Let’s look at an example that is a little more challenging. With your teacher’s help, write in the steps you complete as you go.

$4x-8y=16$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

$-8y=16-4x$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_

$y=-2+\frac{1}{2}x$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

$y=\frac{1}{2}x-2$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. ***Skill Review:*** Put the following equations into slope-intercept form.
	1. $5x+y=9$ b. $4x+2y=-12$

c. $4y-x=16$ d. $4x-2y=-24$

**e.** –y = x -2 f. $-2x+5y=3$

1. Consider the linear equations $2x+y=4$ and $y=4x-2$ from the previous page. Graph both equations on the coordinate plane below.



1. Find the coordinates $(x, y)$ of the point of intersection.
2. Verify that the point of intersection you found satisfies **both** equations.

The **solution(s) to a pair of simultaneous linear equations** is all pairs (if any) of numbers $(x,y)$ that are solutions of both equations, that is $(x,y)$ satisfy both equations. When solved graphically, the solution is the point or points of intersection (if there is one).

1. Determine whether (3, 8) is a solution to the following system of linear equations:

$$2x+y=14$$

$$x+y=11$$

1. Determine whether $\left(0, -5\right)$ is a solution to the following system of linear equations:

$$y=2x-5$$

$$4x+5y=25$$