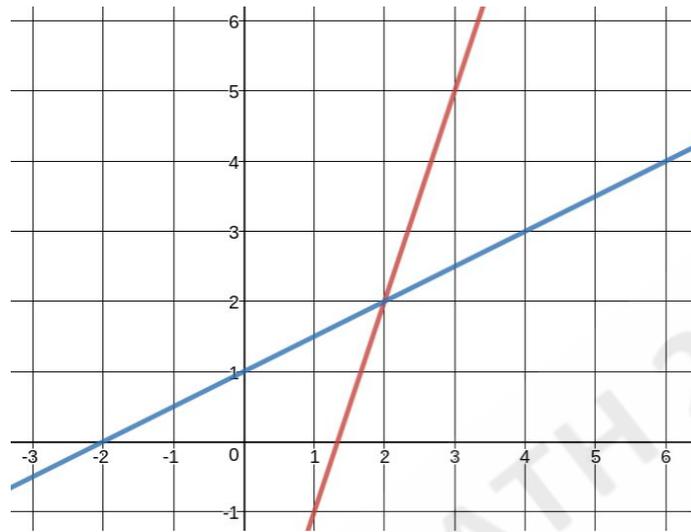


Lesson 1: Graphing Systems of Linear Equations

In Chapter 3, we graphed linear equations in slope-intercept form. In this chapter we will be looking at systems of equations, or, two or more equations graphed on the same coordinate plane.

Exercise #1: Take a look at the *system of linear equations* below.



a) Where do the two lines intersect?

b) What are the equations of these linear functions? You may need to use either slope-intercept form, the point-slope formula, or both. Label these functions $f(x)$ and $g(x)$.

c) Now that you have found the equations of these lines, substitute the intersection point from part “a” into each equation. What do you notice? Why do you think this is the case?

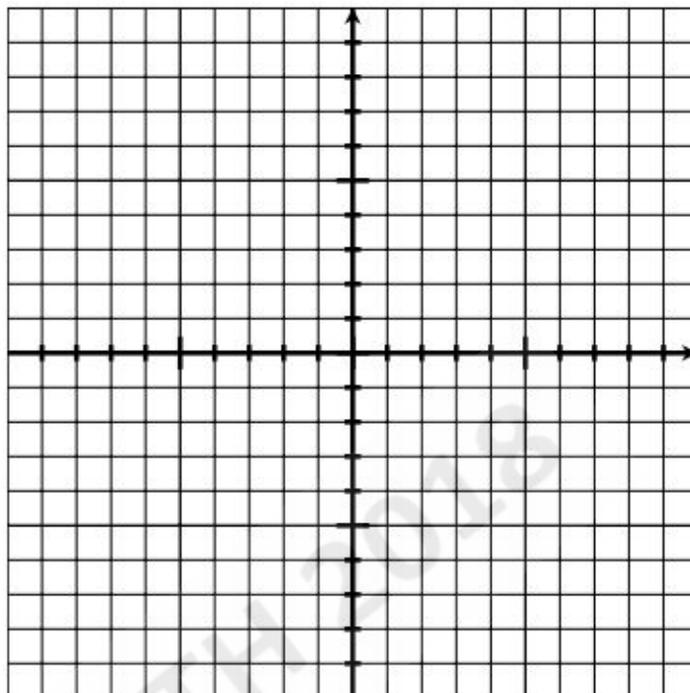
The point of intersection is the point at which $f(x) = g(x)$. This will be helpful to know when solving systems of linear equations.

Now that we recognize how to find a solution to a system of equations, let's try to solve a system of equations by graphing.

Exercise #2: Graph the system of equations on the graph provided. Then, state the solution.

$$y = \frac{-3}{4}x + 2$$

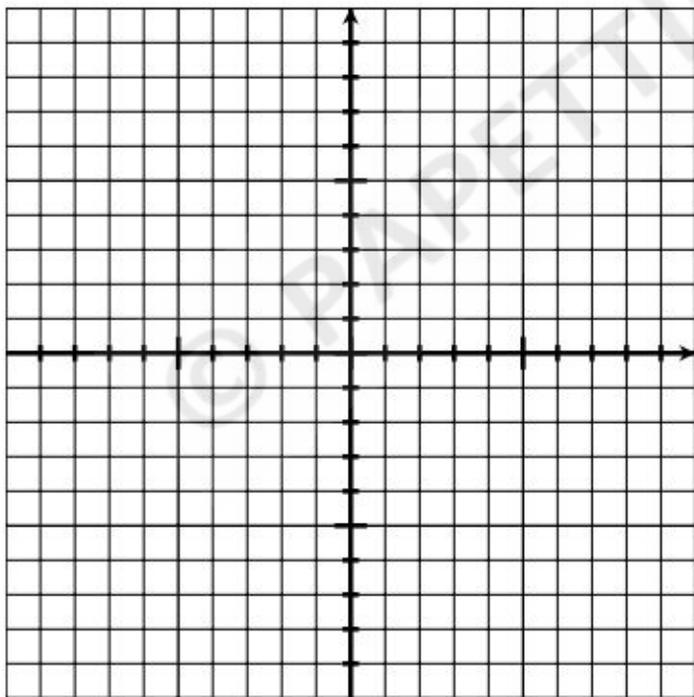
$$y = \frac{1}{2}x - 3$$



Exercise #3: Graph the system of equations and state the solution.

$$4x + 2y = 8$$

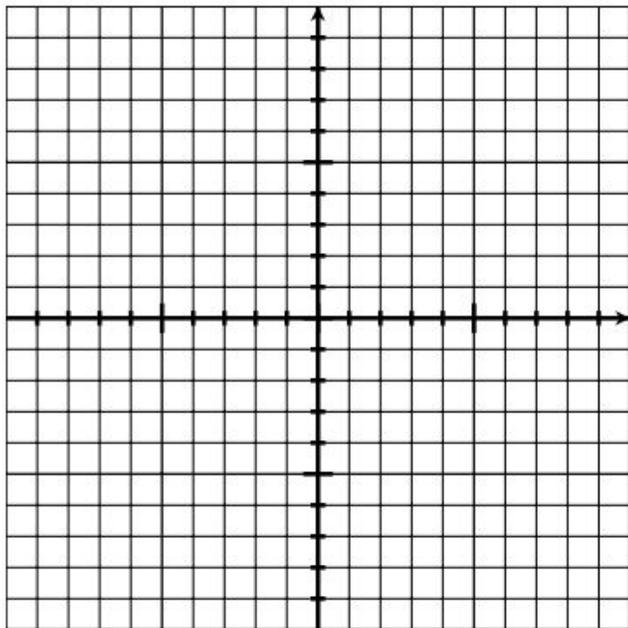
$$6y = 3x + 9$$



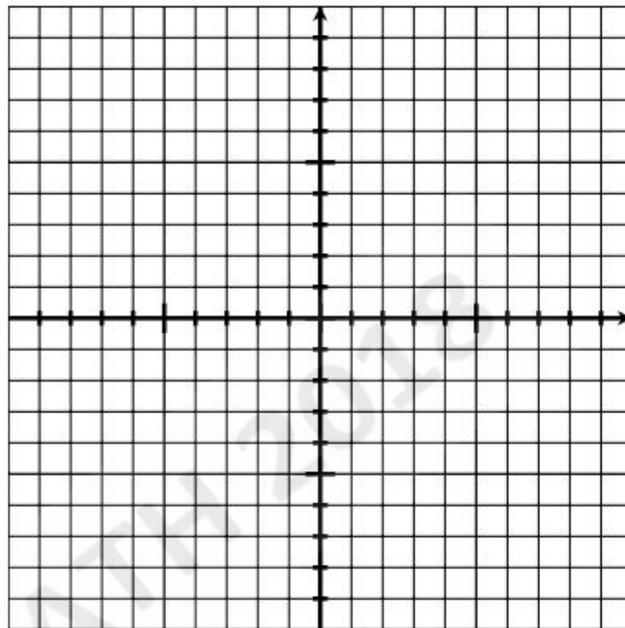
Lesson 1 Extra Practice

EP1. For each of the following, graph the system of equations, and state the solution. Be sure to label your functions.

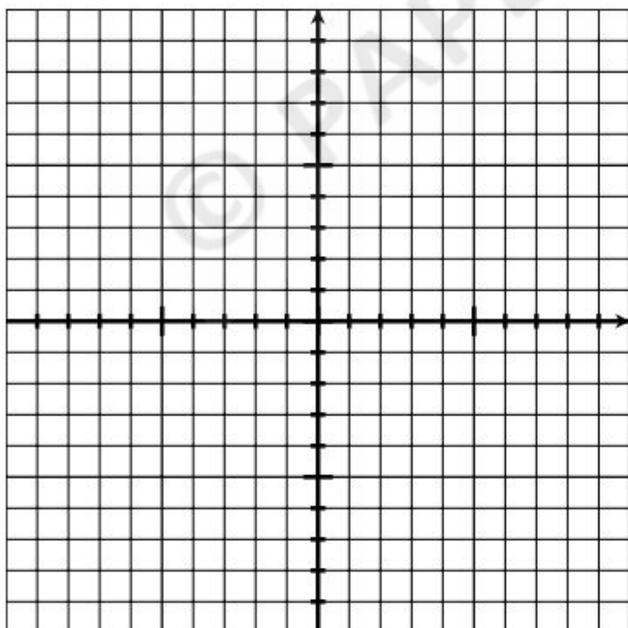
a) $y = -2x$ and $y = \frac{-1}{2}x + 3$



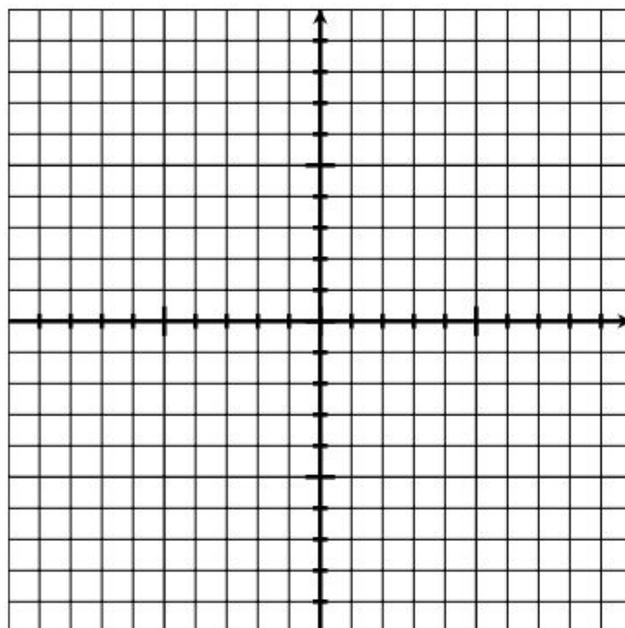
b) $y = \frac{3}{2}x - 2$ and $y = \frac{-5}{2}x + 6$



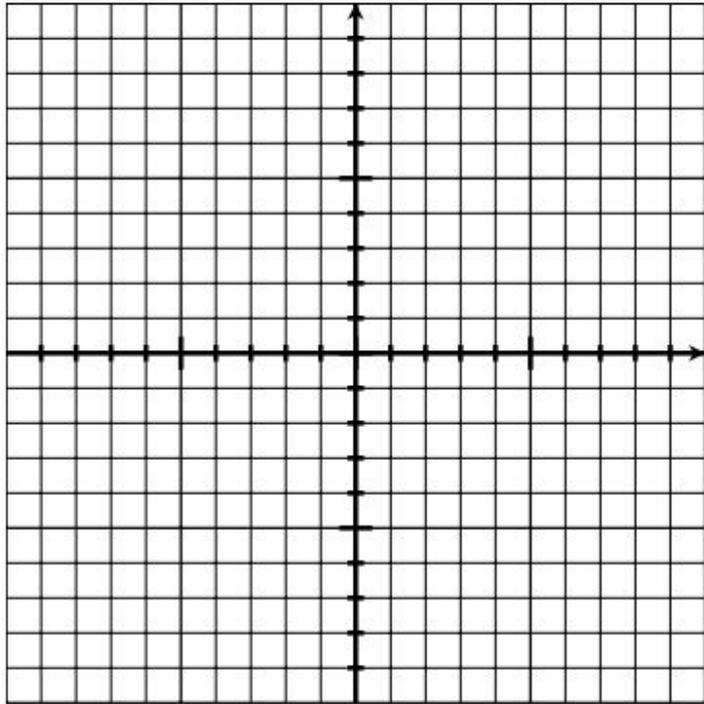
c) $f(x) = \frac{-1}{3}x - 1$ and $g(x) = \frac{1}{6}x - 4$



d) $j(x) = -4$ and $k(x) = -4x$



EP2. Graph the system of equations on the graph below.



$$y = -3$$

$$x = -2$$

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

After graphing the system of equations above, find the area of the shape enclosed by the linear functions.

EP3. Patrick is debating between two different gym memberships. Planetary Gym offers a flat rate of \$50 that includes all specialty classes. Long Island Sports Club charges \$25 for the membership plus an additional \$5 per specialty class. At what number of specialty classes will it be cheaper for Patrick to choose Planetary Gym? Support your answer with the graph.

