

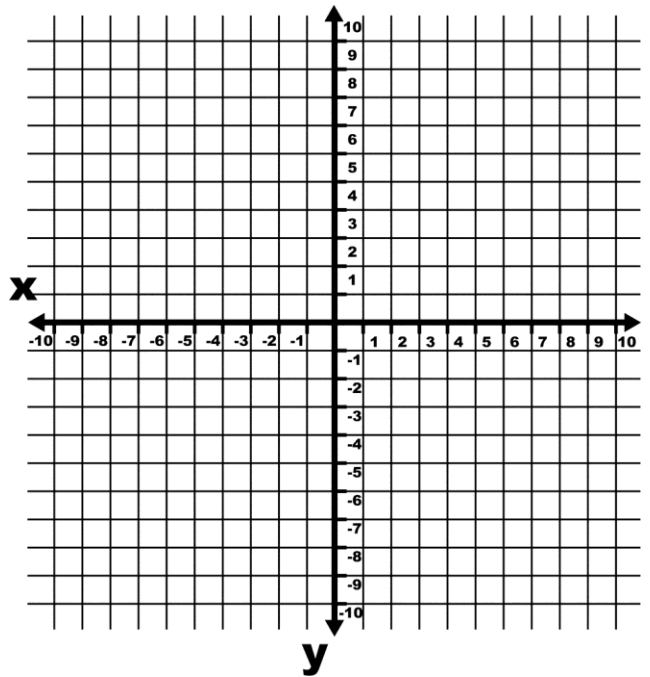
Essential Questions: What is a system of linear equations? How can we solve a linear system graphically?

Do Now:

a) On the same set of axes, graph the following lines.

$$y = -2x + 4$$

$$y = x - 2$$

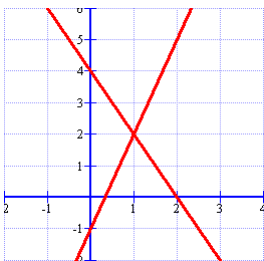


b) At which point do the lines intersect? _____

What is a System of Linear Equations?

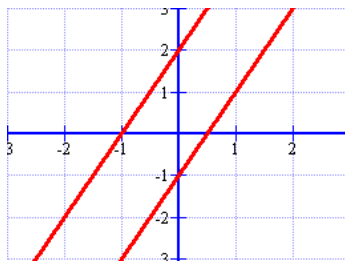
- A **system** of linear equations, *also called a linear system*, consists of two or more linear equations that have the same variables.
- A **solution** of a system of linear equations with two variables is an **ordered pair** that satisfies all of the equations in the system. The **values of the variables** in the ordered pair **make each equation in the system true**.
- When graphing, you will encounter three possible solution sets.

Intersecting Lines



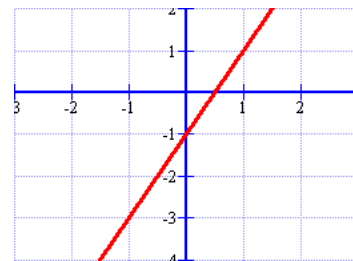
_____ solution

Parallel Lines



_____ solution

Coinciding Lines

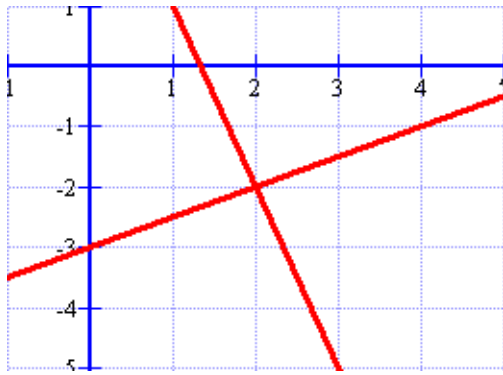


_____ solutions

Parallel lines have the _____ slope and _____ y-intercepts.

Coinciding lines have the _____ slope and _____ y-intercepts.

1) What is the solution of the system graphed below?

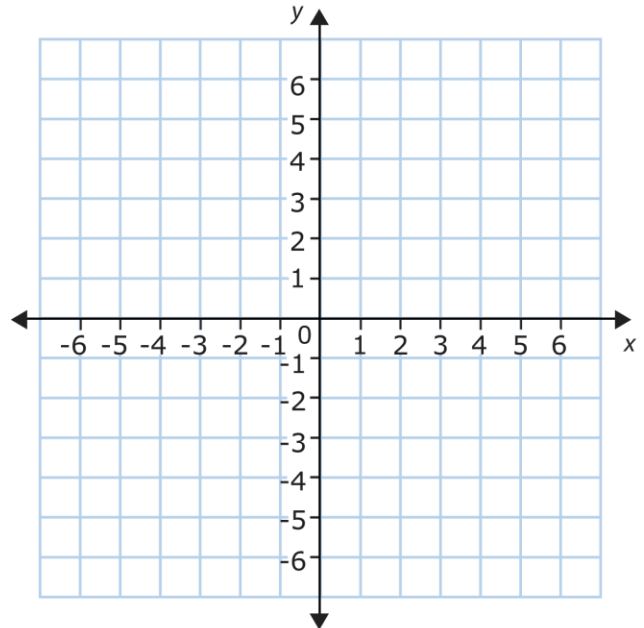


1. (2, -2)
2. (-2, 2)
3. No solution
4. Infinitely many solutions

2) Find the solution to the following system:

$$-3x + 3y = 9$$

$$2x + y = 6$$



Algebraic Check:

Calculator Check:

- 1) Input both equations into $y =$
- 2) 2nd Trace (Calc)
- 3) #5 intersect
- 4) Press Enter 3 times

Also check the table of values

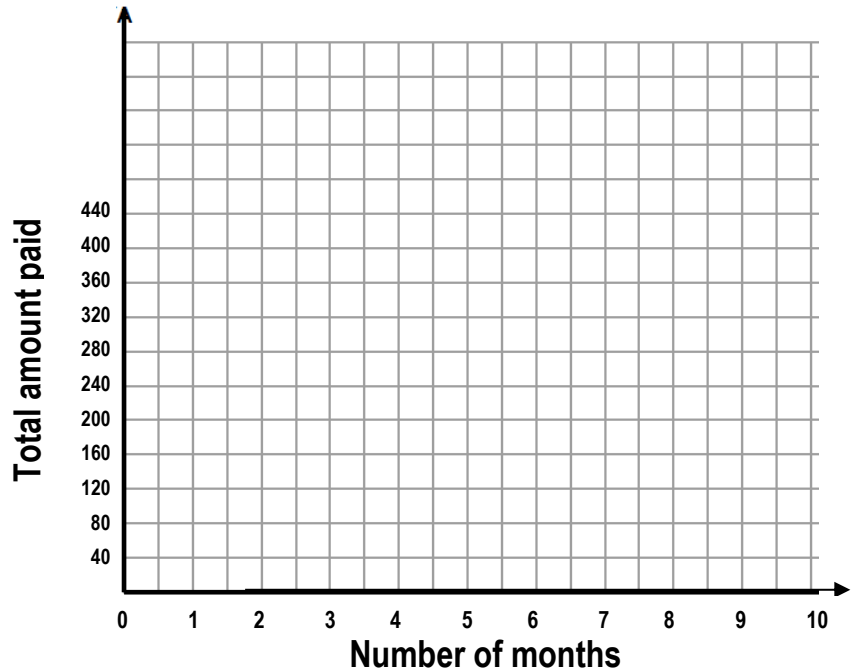
- 3) One family fitness center has a \$50 enrollment fee and costs \$30 per month. Another center has no enrollment fee but costs \$40 per month. Write an equation for each payment option. Let T represent the total amount paid to the fitness center and let m represent the number of months the fitness center is used.

Equation (Option 1): _____

Equation (Option 2): _____

- a. Graph both cost equations over a 10 month period.

X (months)	Y (opt. 1)	Y (opt. 2)
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		



- b. In how many months will both fitness centers cost the same?

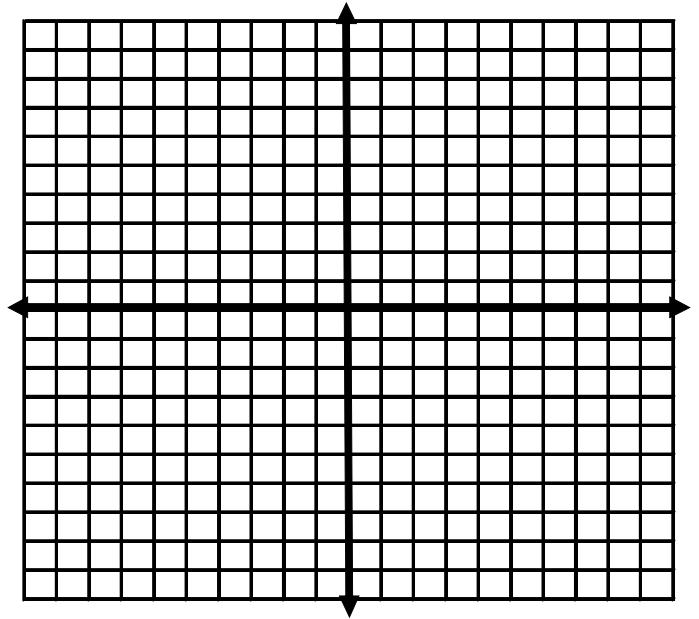


To solve a linear system graphically, graph each _____. Identify the point of _____ of _____. Check the solution with _____ equations. Checks can be done algebraically or using a graphing calculator. Linear systems have 3 possible solution sets: _____ solution, _____ solution or _____ solutions.

Solve the following systems of equations graphically and check. If no solution exists, no check is required.

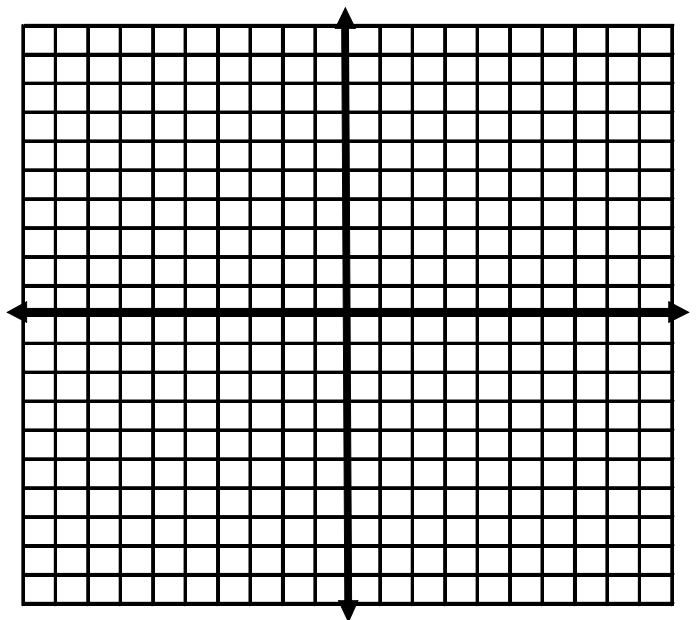
1. $x + y = -3$

$2x = -4 - 2y$



2. $x + y = -2$

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

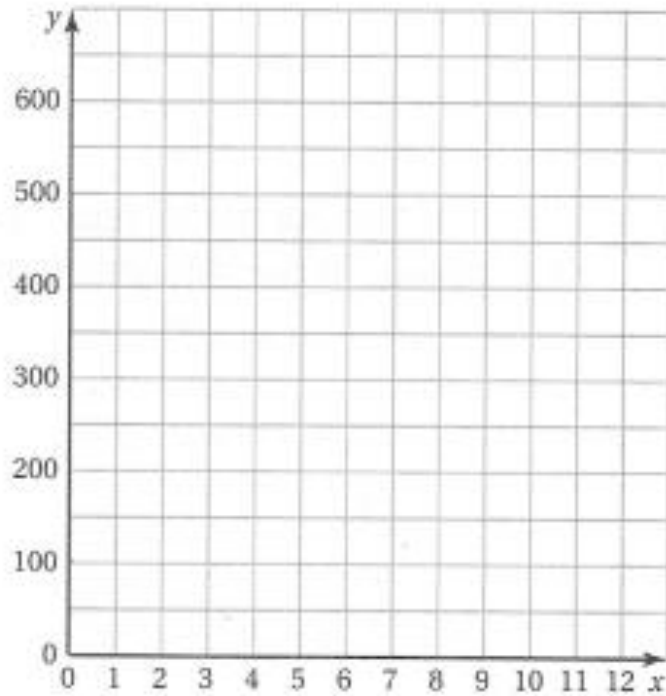


3. Your family starts a bed-and-breakfast. They spend \$500 fixing up a bedroom to rent. The costs for food and utilities is \$10 per night. Your family charges \$60 per night to rent the bedroom. The equation that represents the costs to your family is $y = 10x + 500$ where x represents the number of nights the room is rented. The equation that represents the revenue (income) for your family is $y = 60x$ where x represents the number of nights the room is rented.

a) Use the cost and revenue equations to complete the table below.

x (number of nights)	0	1	2	3	4	5	6	7	8	9	10	11
Cost												
Revenue												

b) Graph the system.



c) State the point of intersection. What does this point tell us in the context of the situation?