

A decorative graphic on the left side of the slide features three balloons in shades of green, blue, and purple, with yellow streamers and triangular flags trailing behind them.

9.1

Linear Systems of Equations in Two Variables

Linear Systems in Two Variables

Linear equation: an equation of the form $ax+by=0$ where a and b are not both zero.

Linear system of equations: a system of equations such as

$$\begin{cases} ax + by = c \\ dx + ey = f \end{cases}$$

is a linear system of equations.

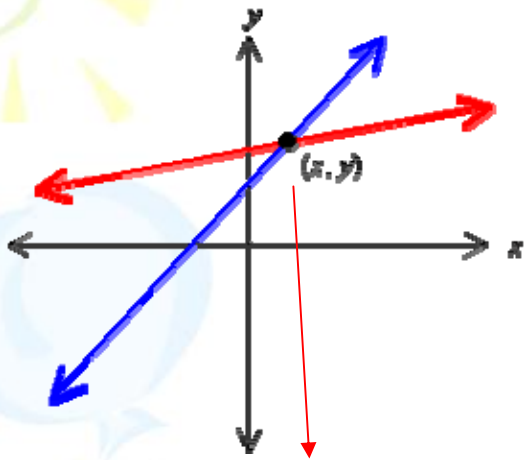
Both equations must be considered together.



Ways To Solve a System of Linear Equations

1. Graphing Method
2. Substitution Method
3. Elimination Method

Possible Solutions for Linear Systems of Equations

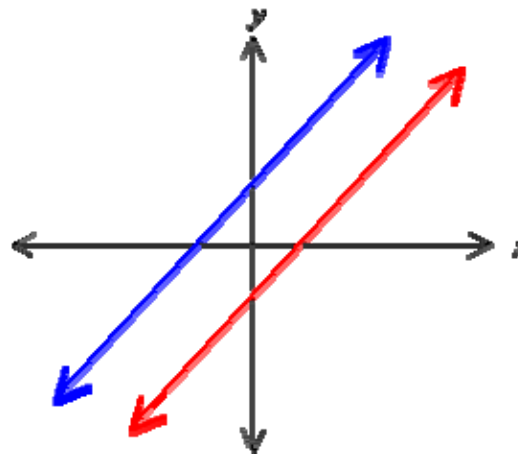


Point of
Intersection

One Solution

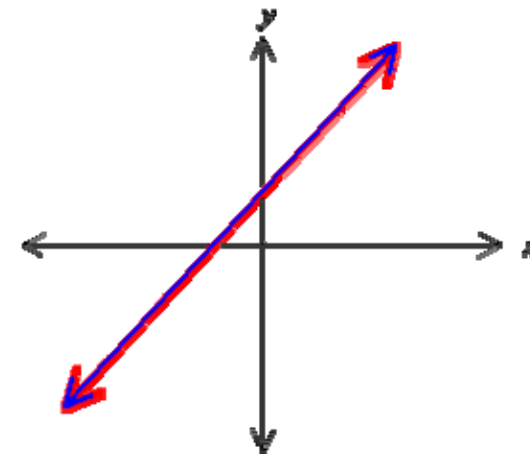
Consistent

Independent



No Solution

Inconsistent



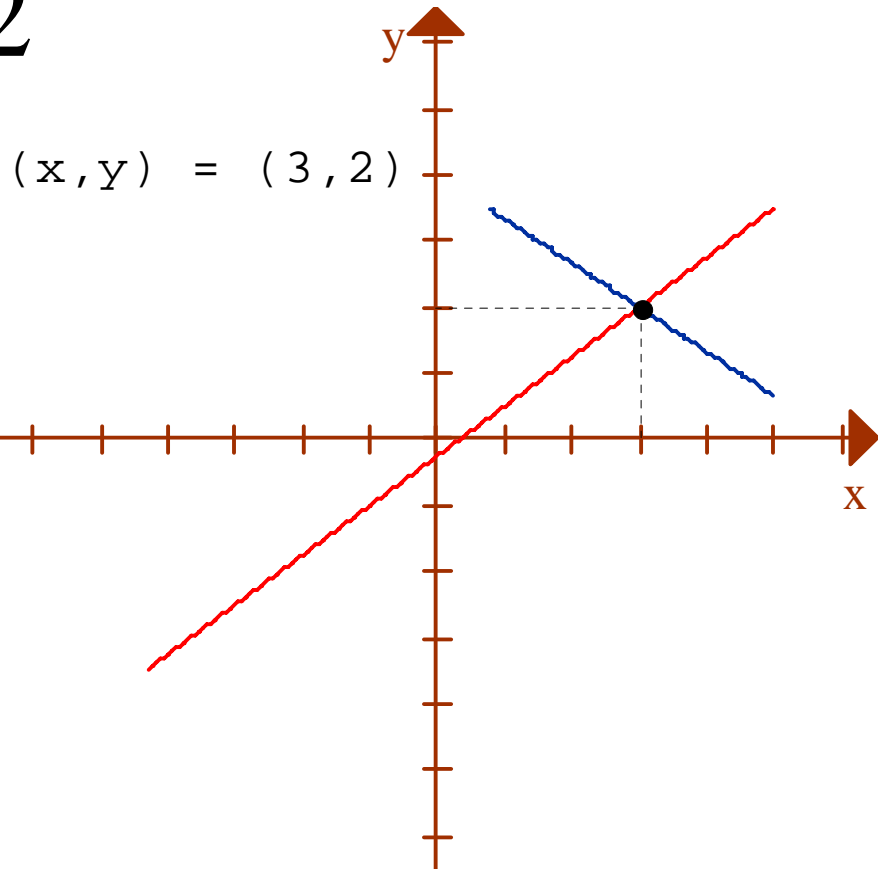
**Infinite
number of
Solutions**

Dependent

Ex: Solve the following system by substitution

$$3x - 4y = 1$$

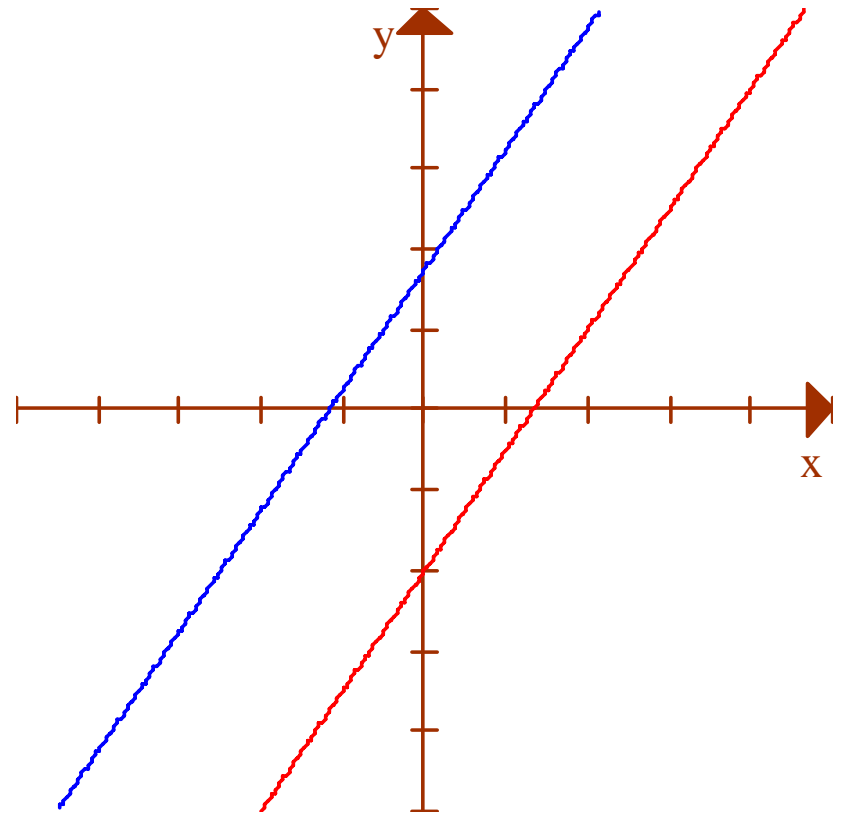
$$2x + 3y = 12$$



Ex: Solve the following system by elimination

$$3x - 2y = 4$$

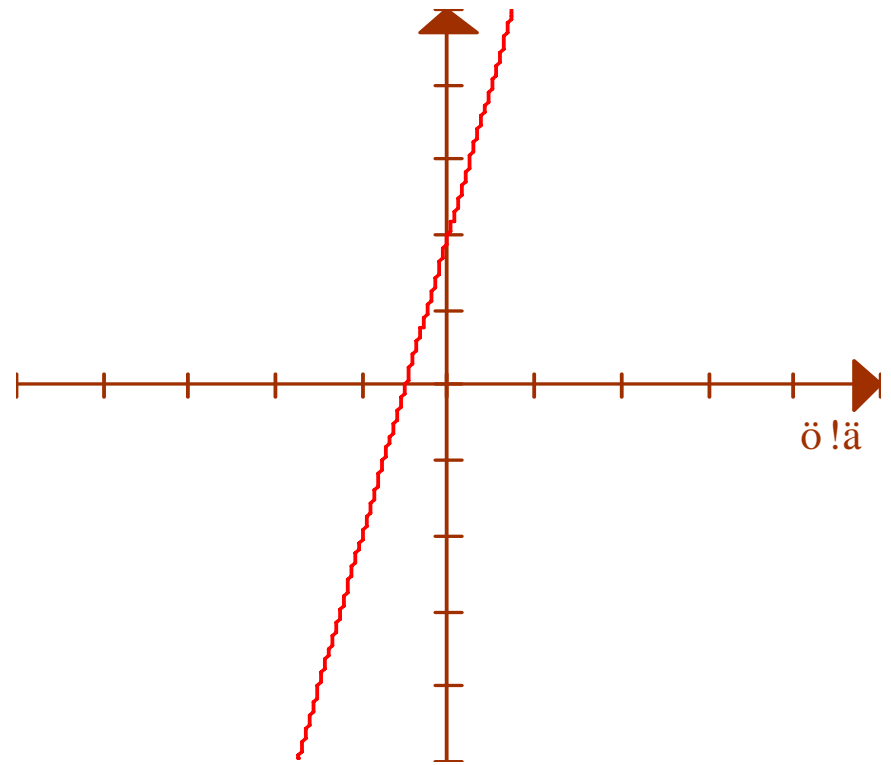
$$-6x + 4y = 7$$

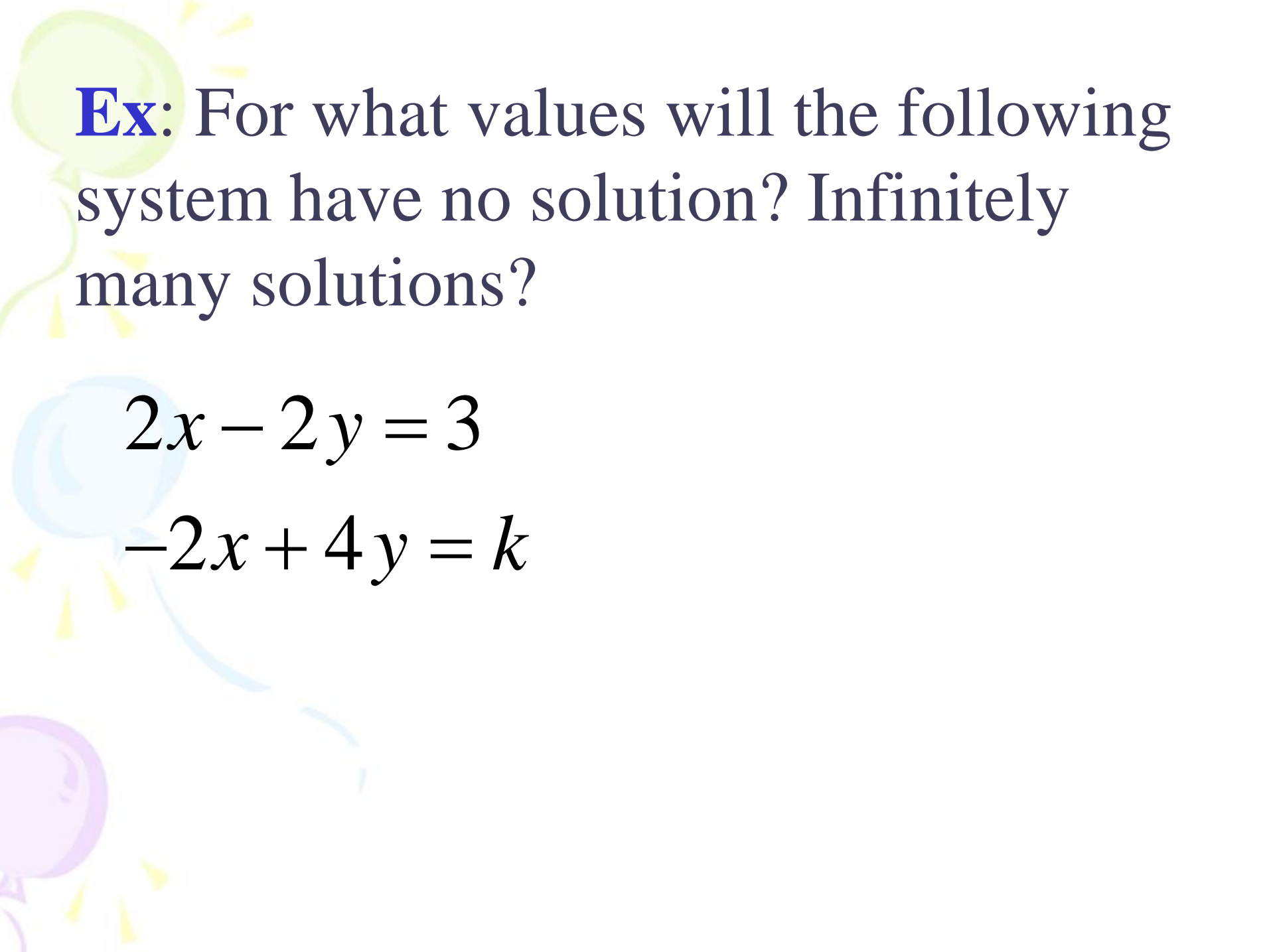


Ex: Solve the following system by elimination

$$8x - 2y = -4$$

$$-4x + y = 2$$

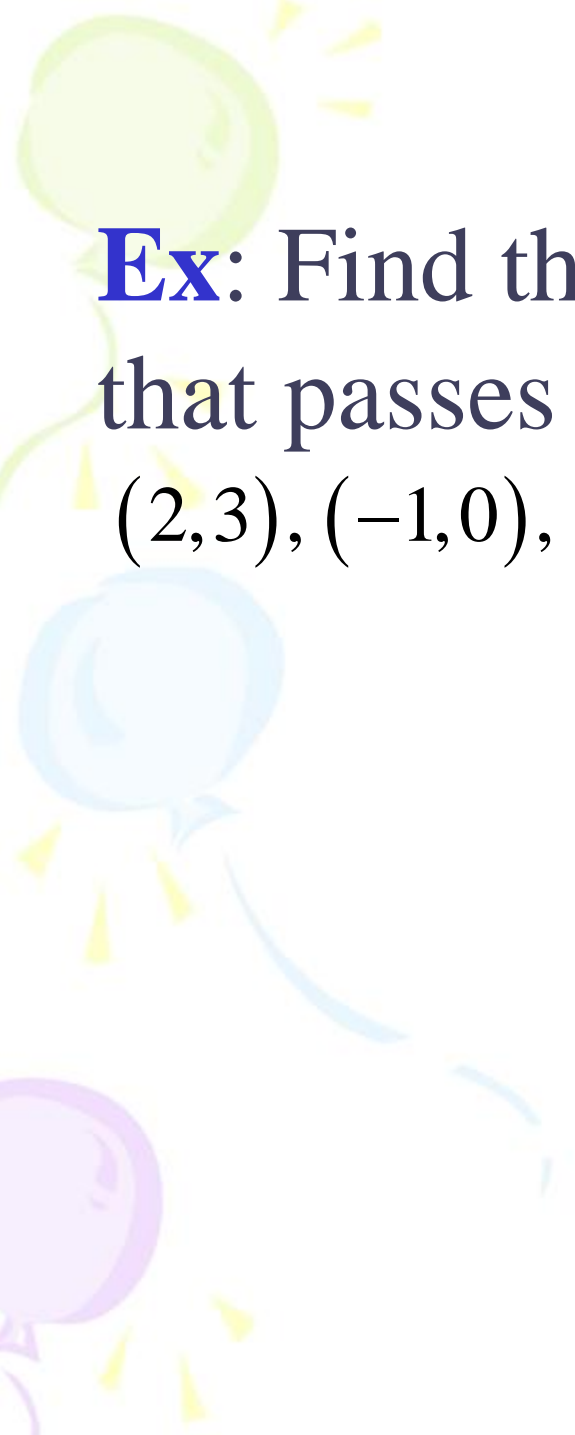


The background features a light green balloon in the top left, a light blue balloon in the middle left, and a purple balloon in the bottom left. Yellow streamers and confetti are scattered throughout the scene.

Ex: For what values will the following system have no solution? Infinitely many solutions?

$$2x - 2y = 3$$

$$-2x + 4y = k$$

A decorative background on the left side of the slide features three balloons in shades of green, blue, and purple, with yellow streamers and starburst shapes trailing from them.

Ex: Find the equation of the parabola that passes through the points $(2,3)$, $(-1,0)$, and $(-2,2)$