CHAPTER 6 SOLVING SYSTEMS OF EQUATIONS AND INEQUALITIES

6.1 SOLVE LINEAR SYSTEMS BY GRAPHING

SYSTEMS OF LINEAR EQUATIONS

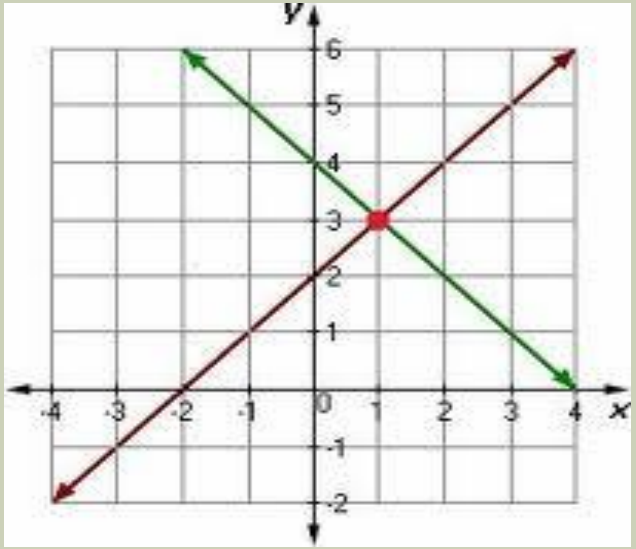
- **System of Linear Equations** – _____ linear equations to be _____ at the _____
- EX:

- **Solution of a System of Linear Equations** – an _____ _____ that satisfies _____ in the system.
- EX:

METHOD 1: SOLVING BY GRAPHING

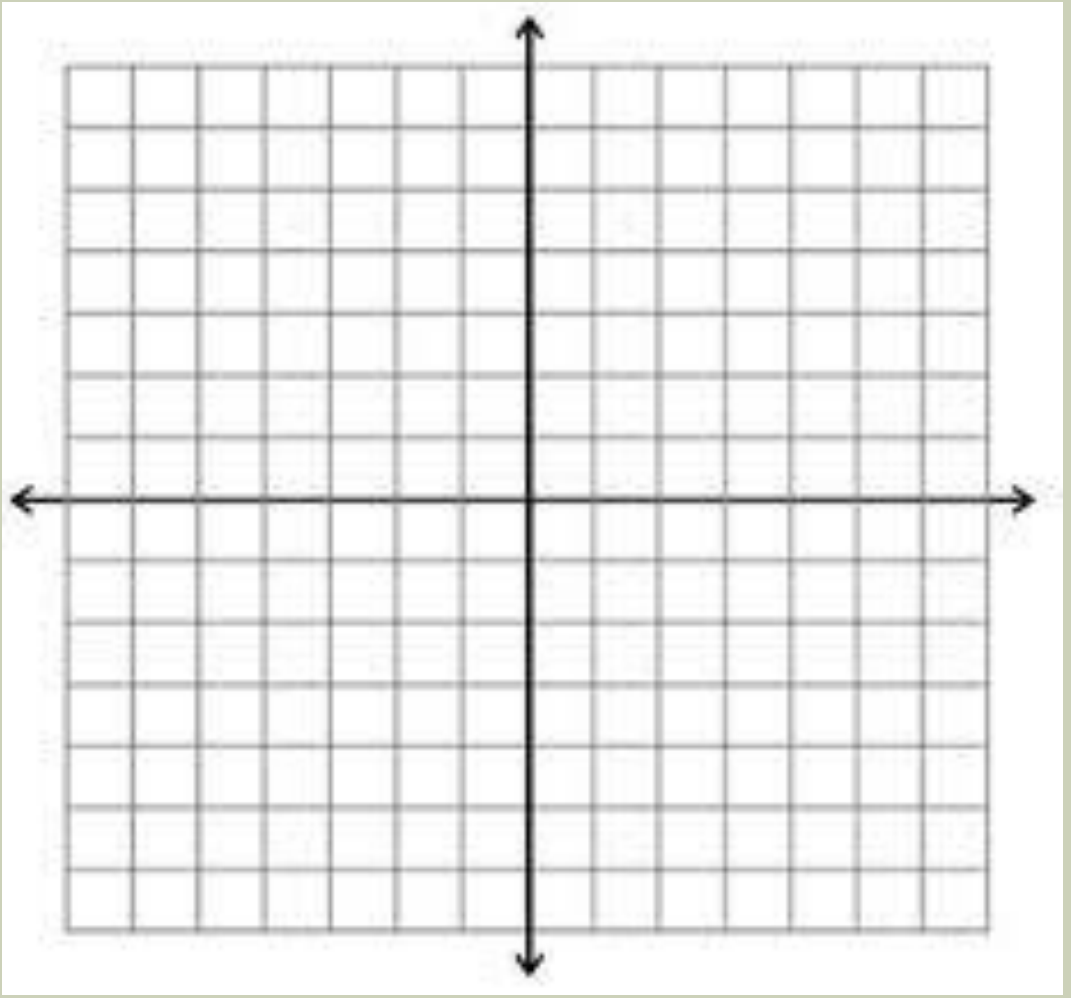
- 1) Graph _____ equations in the _____ _____.
  - Use _____ form.
  - Use your slope to go up and over _____.

- 2) The _____ where the two lines _____ in the _____.

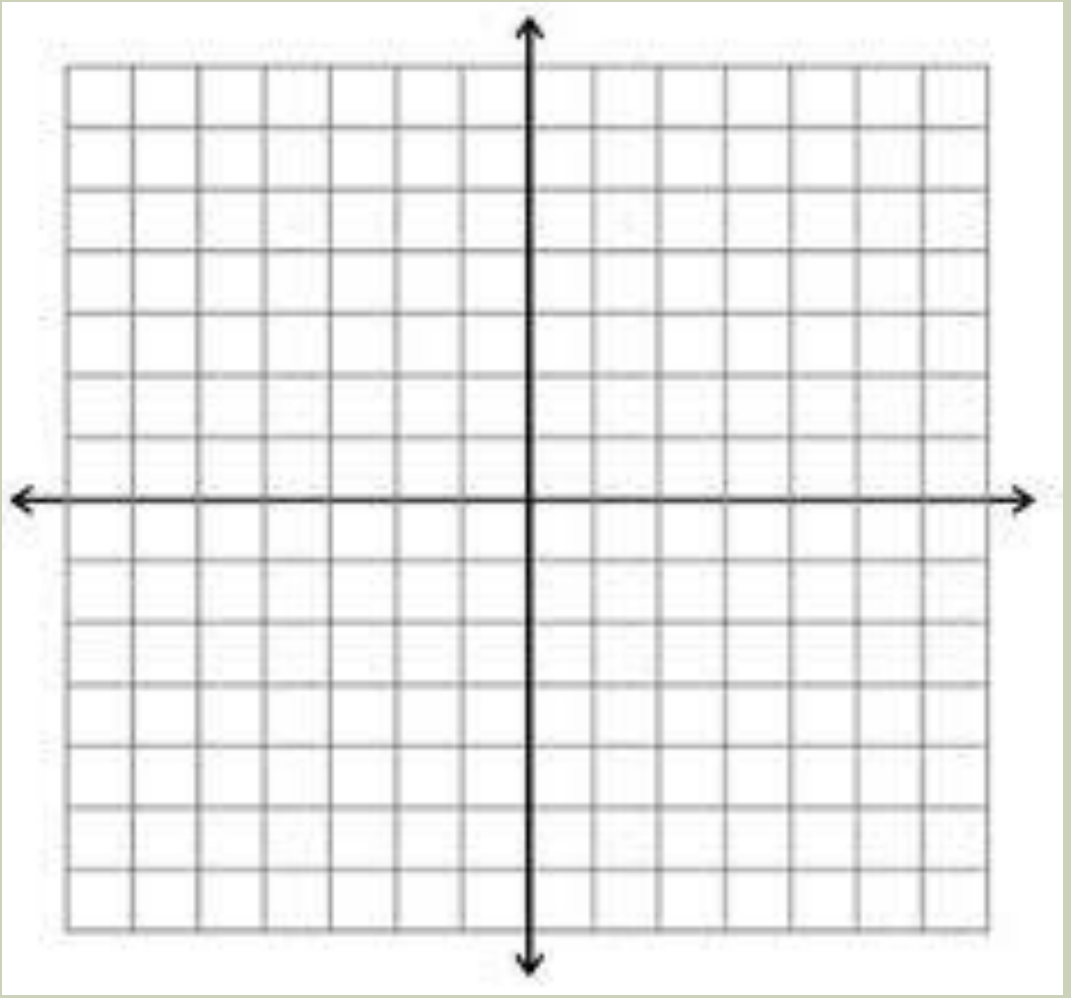


EX: SOLVE THE LINEAR SYSTEM BY GRAPHING.

- $x - y = 5$
- $3x + y = 3$



- $2x + y = -3$
- $-6x + 3y = 3$



6.2 SOLVE LINEAR SYSTEMS BY SUBSTITUTION

METHOD 2: SOLVING BY SUBSTITUTION

- 1) Solve _____ of the equations for _____ _____.
  - Pick the variable that is _____.
- 2) _____ the expression from _____ into the _____ and _____ _____.
- 3) _____ the value from _____ into _____of the equations and _____ for the _____.

NOTEBOOK EXAMPLE #1: SOLVE USING SUBSTITUTION.

- $y = 2x + 5$
- $3x + y = 10$

- $3x + y = -7$
- $-2x + 4y = 0$

- $x + \frac{1}{3}y = -2$
- $-8x - \frac{2}{3}y = 4$

EX:

- Kara spends $16 on tubes of paint and disposable brushes for an art project. Each tube of paint costs $3 and each disposable brush costs $0.50. Kara purchases twice as many brushes as tubes of paint. Find the number of each that she bought.

EX:

- A chemist needs 15 liters of a 60% alcohol solution. The chemist has a solution that is 50% alcohol. How many liters of the 50% alcohol solution and pure alcohol should the chemist mix together to make 15 liters of a 60% alcohol solution?

6.3 SOLVE LINEAR SYSTEMS BY ADDING OR SUBTRACTING

METHOD 3: SOLVING BY ELIMINATION

- 1) _____ the equations to _____ one variable.
  - Make sure _____are _____.
- 2) Solve the _____ for the _____ variable.
- 3) _____ the value from _____ into _____ and _____ for the _____.

NOTEBOOK EXAMPLE #2: SOLVE BY ELIMINATION

- $4x - 3y = 5$
- $-2x + 3y = -7$

- $7x - 2y = 5$
- $7x - 3y = 4$

- $3x + 4y = -6$
- $2y = 3x + 6$

EX:

- During a kayak trip, a kayaker travels 12 miles upstream (against the current) in 3 hours and 12 miles downstream (with the current) in 2 hours. The speed of the kayak remained constant throughout the trip. Find the speed of the kayak in still water and the speed of the current.

http://www.physicsclassroom.com/mmedia/vectors/plane.cfm

Riverboat Simulator

EX:

- A business center charges a flat fee to send faxes plus a fee per page. You send one fax with 4 pages for $5.36 and another fax with 7 pages for $7.88. Find the flat fee and the cost per page.

6.4 SOLVE LINEAR SYSTEMS BY MULTIPLYING FIRST

METHOD 3: SOLVING BY ELIMINATION

- Sometimes you may have to _____ one or both equations by a _____ to create _____ that are _____ of each other.
  - Doing this will allow you to _____ a variable when the equations are _____.

NOTEBOOK EXAMPLE #3: SOLVE BY ELIMINATION

- $2x + 5y = 3$
- $3x + 10y = -3$

- $8x - 5y = 11$
- $4x - 3y = 5$

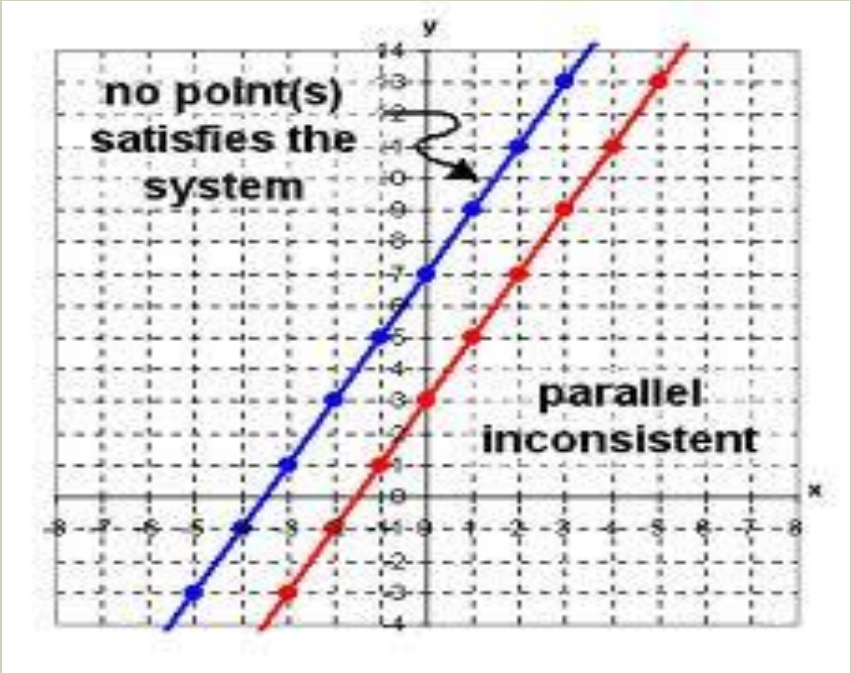
- $3x - 7y = 5$
- $9y = 5x + 5$

EX:

- Dunham's is having a sale on soccer balls. A soccer coach purchases 10 soccer balls and 2 soccer ball bags for $155. Another coach purchases 12 soccer balls and 3 soccer ball bags for $189. Find the cost of a soccer ball and the cost of a soccer ball bag.

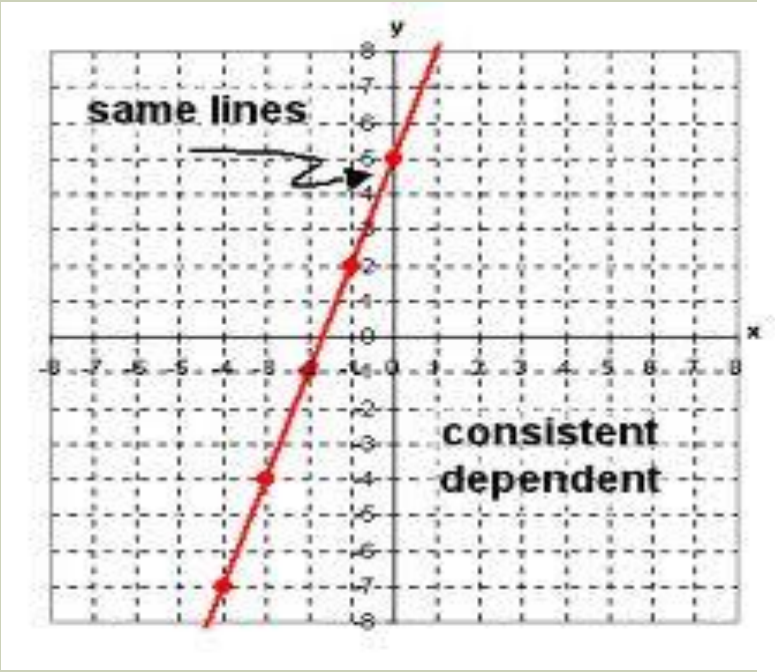
6.5 SOLVE SPECIAL TYPES OF LINEAR SYSTEMS

- A system of equations has _____if the lines are _____.
  - Same _____.
  - Different _____.
  - Called an _____ _____.

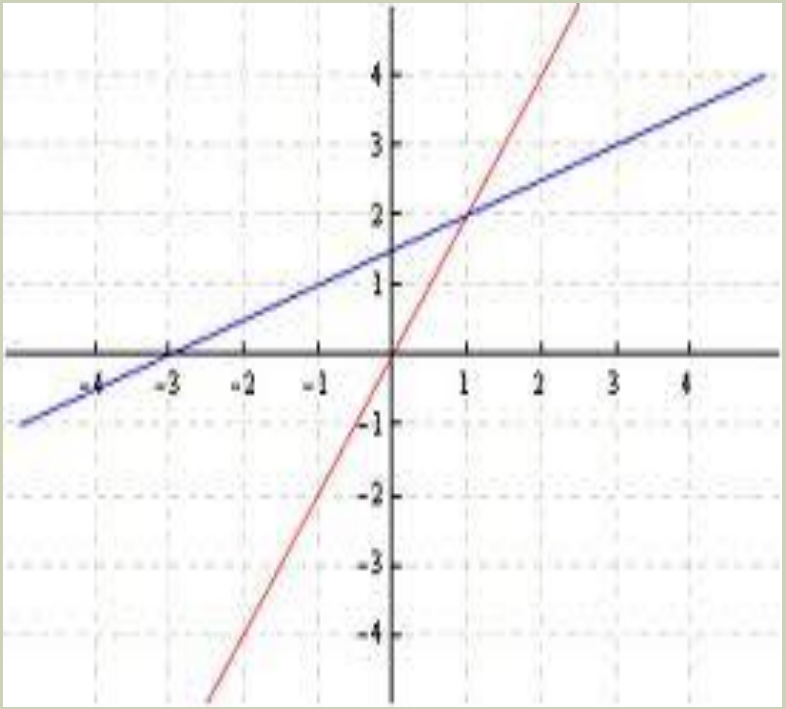


- A system of equations has _____ solutions if the lines are _____.
  - Same _____.
  - Same _____.
  - Called a _____

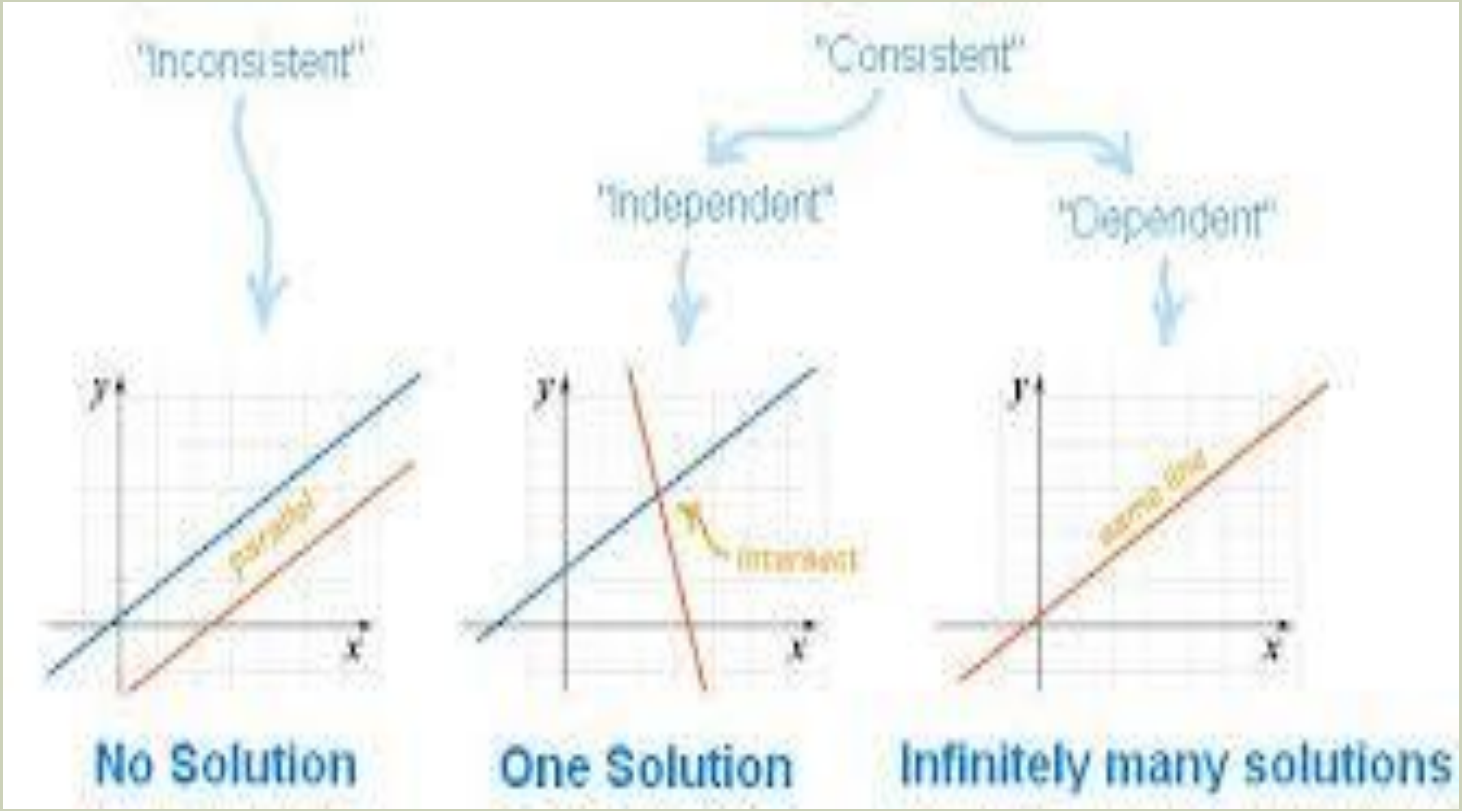
    _____



- A system of equations has _____ if the lines _____.
  - Different _____.
  - Called _____
    _____



SUMMARY:


"Inconsistent"
"Consistent"
"Independent"
"Dependent"
y
x
parallel
intersect
same line
No Solution
One Solution
Infinitely many solutions

NOTEBOOK EXAMPLE #4
SOLVE THE SYSTEM USING SUBSTITUTION OR ELIMINATION.

- $5x + 3y = 6$
- $15x + 9y = 8$

- $y = 2x - 4$
- $-6x + 3y = -12$

- $3x - 2y = -5$
- $4x + 5y = 47$

NOTEBOOK EXAMPLE #5

- Without solving the linear system, tell whether it has one solution, no solution, or infinitely many solutions.

- $5x + y = -2$
- $-10x - 2y = 4$

- $6x + 2y = 3$
- $6x + 2y = -5$

EX:

- A pizza parlor fills two pizza orders. Is there enough information to determine the cost of one medium pizza?

Medium	Large	Cost
4	12	$168
8	24	$336