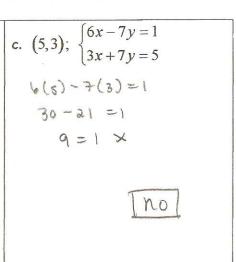
Recall that a <u>545 tem</u> of equations is a set of two or more equations containing two or more variables. A <u>linear</u> system is a system of equations containing only linear equations.

On a graph of the system of two equations, the solution is the set of all points where the lines intersect. A point is a solution to a system of equations if the x- and y-values of the point satisfy both equations.

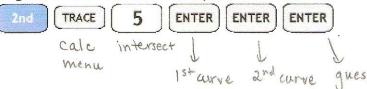
Use substitution to determine if the given ordered pair is an element of the solution set fo Example 1: auations.

	the system of eq
a. $(2,4)$; $\begin{cases} x \\ 2y \end{cases}$	-2y = -6 $x + y = 8$
2-2(4)	= -6
2-8=-1	0
-6=-6	~
2(2)+4	=8
8 = 4 + 4	r
8=80	Mes
	1

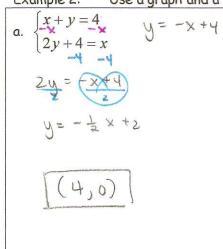
b.
$$(3,2)$$
; $\begin{cases} 2x+3y=12\\ 8x-6y=24 \end{cases}$
 $\Rightarrow (3)+3(3)=12$
 $\Rightarrow +b=12$
 $\Rightarrow (3)-b(3)=24$
 $\Rightarrow (3)-b(3)=34$
 $\Rightarrow (3)-b(3)=34$
 $\Rightarrow (3)-b(3)=34$
 $\Rightarrow (3)-b(3)=34$

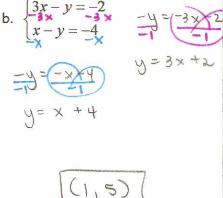


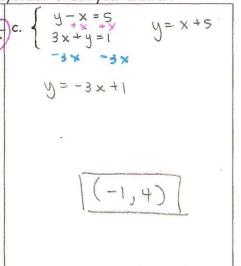
You can use your graphing calculator to graph a system of equations and then to find the solution. How do we get the calculator to find the point of intersection? Once you have the system graphed, press the keys:

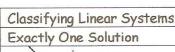


Use a graph and a table on your calculator to solve each system. Check your answer.



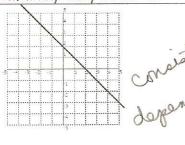






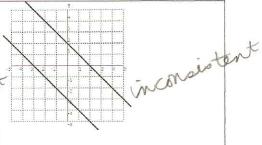
The graphs are intersecting lines with different slopes.

Infinitely Many Solutions



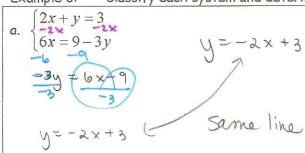
The graphs are coinciding lines; they have the same slope and the same y-intercept.

No Solution



The graphs are parallel lines; they have the same slope but different y -intercepts.

Example 3: Classify each system and determine the number of solutions.



Consistent, dependent; infinite soln's

b.
$$\begin{cases} x+4=y \\ 5y=5x+35 \\ \hline$$

y=x+7 y=x+4 Same slope, different y-int

inconsistent, no sol'n

Example 4: Application

Big Dog Snowboard Co. charges \$15 for equipment rental plus \$35 per hour for snowboarding lessons. Half-Pipe Snowboards, Inc. charges \$40 for equipment rental plus \$25 per hour for lessons. For what number of hours is the cost of equipment and lessons the same for each company? Solve by graphing on your calculator once you have written your system of equations.

window: x from 0 to 10 y from 0 to 200

$$y = 15 + 35 \times$$

 $y = 40 + 25 \times$
hours cost
(2.5, 102.5)

for 2 the same