Write your questions here!

We learned 3 different ways to solve linear systems of equations: graphing, substitution and elimination. But sometimes, weird things can happen:

Examples:

Solve each linear system by graphing:

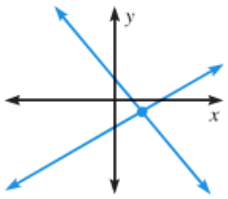
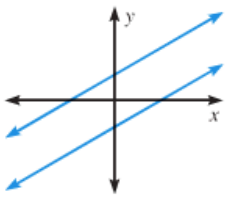
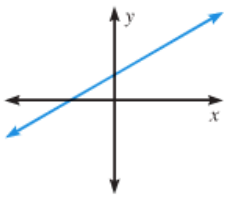
1. $y = \frac{1}{2}x - 4$
   $y = \frac{1}{2}x + 2$

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

Possible Outcomes When Solving by Graphing

CONCEPT SUMMARY *For Your Notebook*

Number of Solutions of a Linear System

One solution	No solution	Infinitely many solutions
		
The lines intersect. The lines have different slopes.	The lines are parallel. The lines have the same slope and different *y*-intercepts.	The lines coincide. The lines have the same slope and the same *y*-intercept.

You try! Solve each linear system by graphing. (Be sure to solve for y first!)

3. $y = 3x - 6$
   $y - 3x = 1$

4. $y = 4x - 1$
   $-2y = -8x + 2$

Write your questions here!

So what does this look like when solving by substitution and elimination?

Solve by substitution:

5. $-16x + 2y = -2$

$y = 8x - 1$

Solve by elimination:

6. $-18x + 6y = 24$

$3x - y = -2$

		POSSIBLE OUTCOMES		
		No Solution	1 Unique Solution	Infinitely Many Solutions
METHOD OF SOLVING	Graphing	Parallel Lines	Lines Intersect Once	Both Lines are the Same When Graphed
	Substitution or Elimination	Variables Cancel; Sides Not Equal	Each Variable Has One Solution	Variables Cancel; Sides are Equal

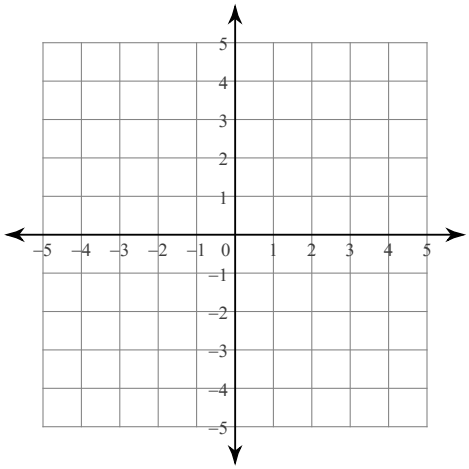
Now, summarize your notes here!

Practice 8.4 Special Systems

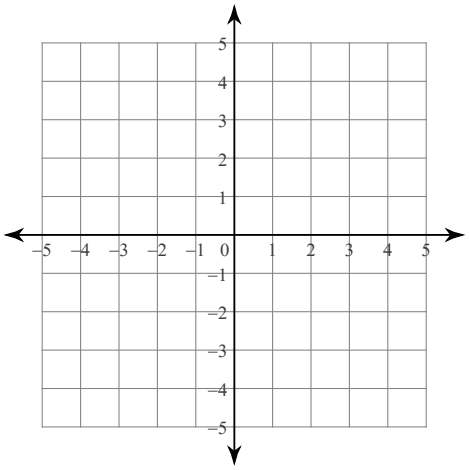
Show all of your work!

Solve each system by graphing.

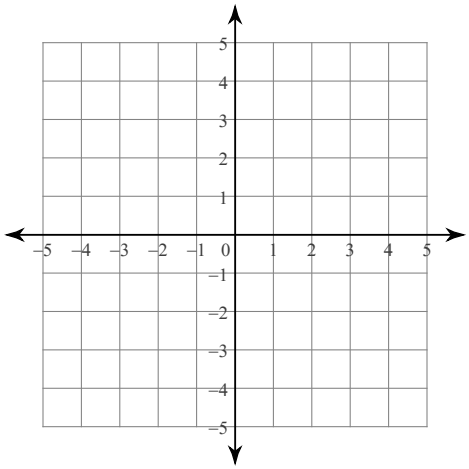
1) $y = -x - 4$
$y = x - 2$



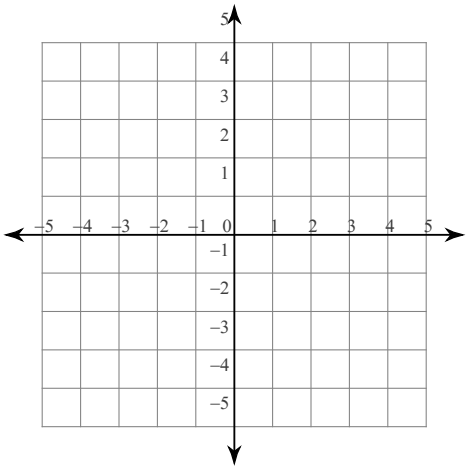
2) $y = \frac{1}{2}x + 2$
$y = \frac{1}{2}x - 3$



3) $x + y = 3$
$x + y = -1$



4) $2x - y = -4$
$2x - y = -2$



Solve each system by elimination.

5) $-3x + 7y = -2$
$6x - 14y = 4$

6) $16x - 4y = -4$
$-8x + y = -3$

7) $9x + 15y = -12$
$-3x - 5y = 7$

8) $-5x - 4y = -1$
$10x + 8y = 2$

Solve each system by substitution.

9) $12x - 2y = 3$
$y = 6x - 2$

10) $y = 3x + 21$
$-9x + 3y = 63$

11) $3x - 6y = -6$
$y = x - 2$

12) $y = -8x - 1$
$24x + 3y = -3$

Application and Extension

1. Solving Linear Systems Solve the linear system using graphing, substitution or elimination.

$x + 3y = -1$

$-2x - 6y = 8$

Solution_____

2. Sully is approached by students to help make some crafts for a fundraiser.
He decides on helping out by selling his two favorite crafts, *Algebracelets* and **Mathemagic-Markers,** at two big upcoming gatherings.

Event	*Algebracelets* sold	**Mathemagic-Markers** sold	Total Amount of Money Collected
K-Town Valentine's Day Dance	9	3	$ 27
DoDDS-E Cheerleading Tournament	12	4	$ 36

Let a = the price of an *Algebracelet* Let m = the price of a **Mathemagic-Marker**

Take the information in the table and write two equations that represent the income from Sully's fundraising crafts. Then, solve the linear system using graphing, substitution or elimination to find the cost of each craft.

Equation #1: _____ (Representing income from K-Town dance)

Equation #2:_____ (Representing income from Tournament)

Find TWO different possible solutions to this problem:

Cost of *Algebracelets*_____.	Cost of *Algebracelets*_____.
Cost of **Mathemagic-Markers** _____.	Cost of **Mathemagic-Markers** _____.

Coming Up: Rewrite each using an exponent.

1. $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 =$ _____	2. $10 \cdot 10 \cdot 10 \cdot 10 =$ _____	3. $x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x =$ _____

Quick Review: Find the equation of the line that passes through the given points.

1. (-2, 3); (-2, -3)	2. (2, 3); (-5, 3)	3. (-1, 3); (0, 4)