http://algebra.flippedmath.com/84-solving-special-case-systems.html

1. Use the information given to answer the question.

A parking meter only accepts dimes and quarters. A parking meter attendant empties the machine to find $1.75.

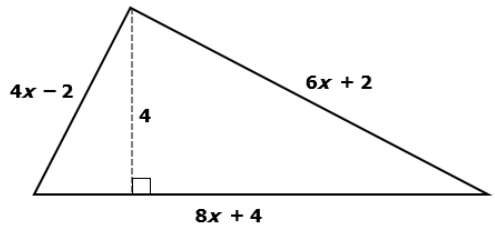
Part A

If x represents the number of dimes, and y represents the number of quarters, what are the possible values of x, the domain of the function?

- all positive integers
- all real numbers
- {0, 5, 10, 15}
- {0, 5, 10, 15, 20, 25}

2. **For this item, show matches by dragging the answers into the appropriate boxes.**

The area of a triangle is represented by the formula $A = \frac{1}{2}bh$. The perimeter of a triangle is the sum of its sides.



$A = \frac{1}{2}bh$
$= \frac{1}{2}(8x+4)(4)$
$= 2(8x+4)$
$\frac{1}{2}(4)(8x+4)$

Match the area and perimeter of the triangle to the correct expressions.

area	$16x+8$
perimeter	$18x+4$

$8x+4+4x-2+6x+2$
$18x+4$

$12x+4$ | $16x+8$ | $18x+4$ | $18x+8$ | $32x+16$

3. $x - 2y = -9$
$-4x - 2y = -4$ $\cdot(-1)$
$4x + 2y = 4$
$1x - 2y = -9$

$5x = -5$
$\frac{5}{5} \quad \frac{-5}{5}$
$x = -1$

$x - 2y = -9$
$-1 \quad +1$
$-2y = -8$
$\frac{-2y}{-2} = \frac{-8}{-2}$
$y = 4$

$(-1, 4)$

11. $2x + y = 2$
$4x - 2y = 2$

(x, y)
$(0, 0)$

$4(0) - 2(0) \stackrel{?}{=} 2$
$0 - 0 \neq 2$

NO

[8.4: SOLVING SPECIAL SYSTEMS] 1

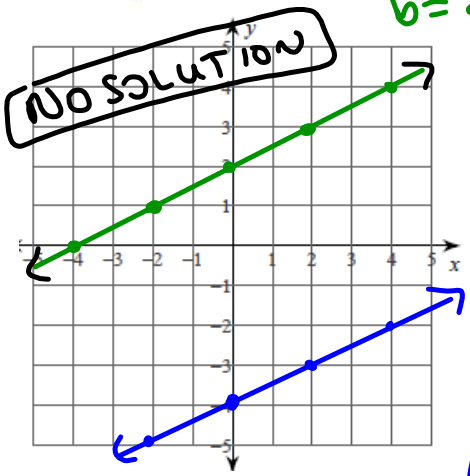
We learned 3 different ways to solve linear systems of equations: graphing, substitution and elimination. But sometimes, weird things can happen:

Examples:

Solve each linear system by graphing:

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

$y = \frac{1}{2}x + 2$ $m=\frac{1}{2}$ $b=2$



NO SOLUTION

$5x+3y=6$

$-5x \quad -5x$

$\frac{3y}{3} = \frac{-5x+6}{3}$

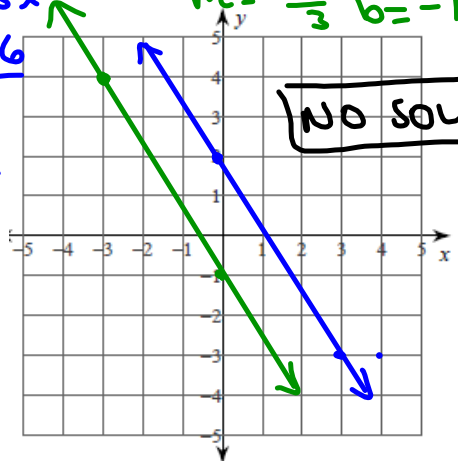
$y = -\frac{5}{3}x+2$

2. $5x + 3y = 6$

$\frac{3y}{3} = \frac{-5x - 3}{3}$

$y = -\frac{5}{3}x - 1$

$m=-\frac{5}{3}$ $b=-1$

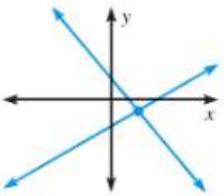
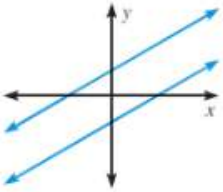
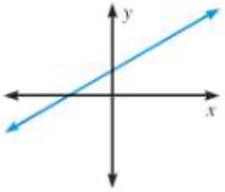


NO SOLUTION

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 are parallel.	The lines coincide.
The lines have different slopes.	The lines have the same slope and different *y*-intercepts.	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. $y = 3x - 6$ $m=3$ $b=-6$

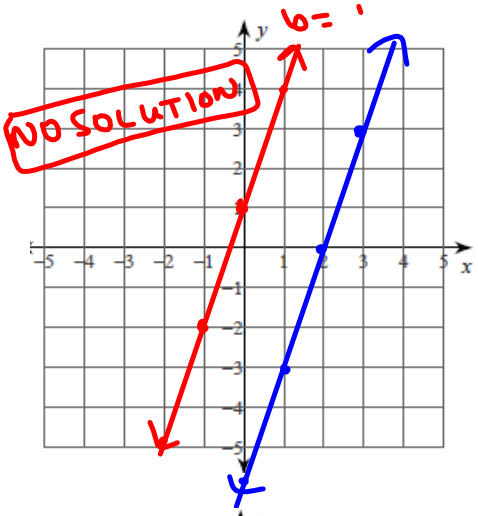
$y - 3x = 1$

$+3x \quad +3x$

$y = 3x + 1$

$m = 3$

$b = 1$



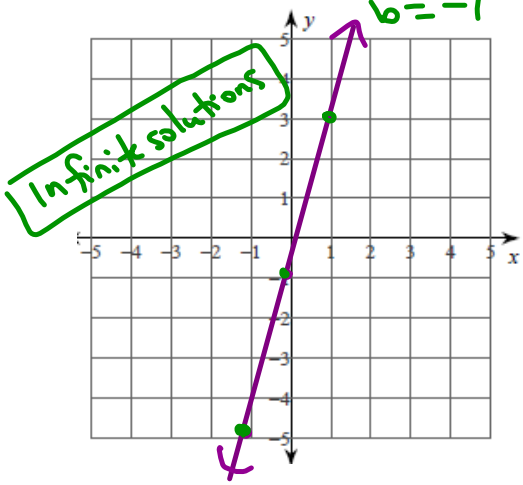
4. $y = 4x - 1$ $m=4$ $b=-1$

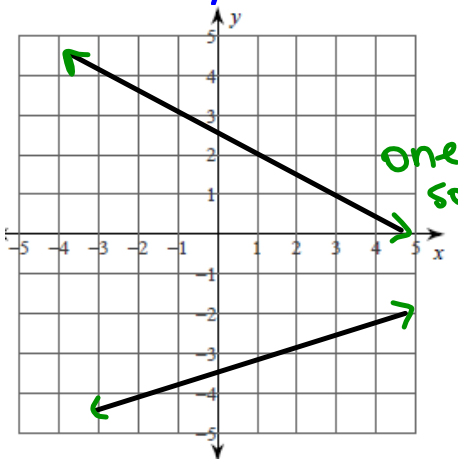
$\frac{-2y}{-2} = \frac{-8x + 2}{-2}$

$y = 4x - 1$

$m = 4$

$b = -1$





one solution → differ slopes

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

Solve by substitution:

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

$y = 8x - 1$

$-16x + 2(8x - 1) = -2$

$-16x + 16x - 2 = -2$

$-2 = -2$ ✓

infinite solutions

Solve by elimination:

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

$[3x - y = -2]6$

$18x - 6y = -12$

$-18x + 6y = 24$

$0 \neq 12$

NO solution

		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

2-12 EVEN

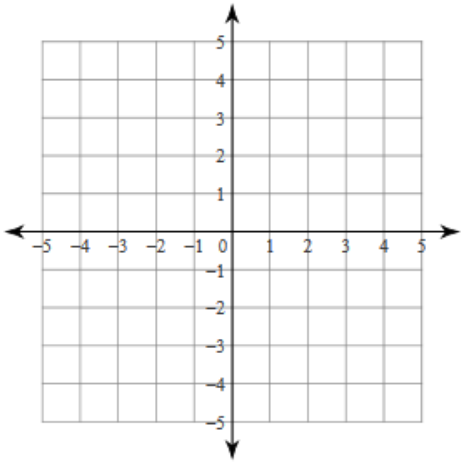
Practice 8.4 Special Systems

HW

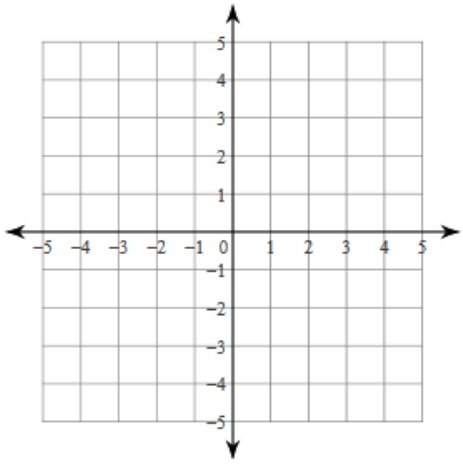
Show all of your work!

Solve each system by graphing.

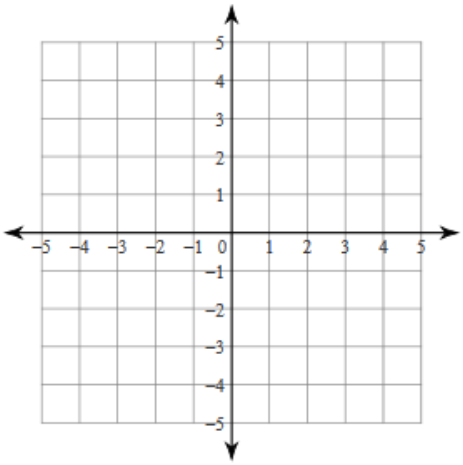
1) $y = -x - 4$
$y = x - 2$



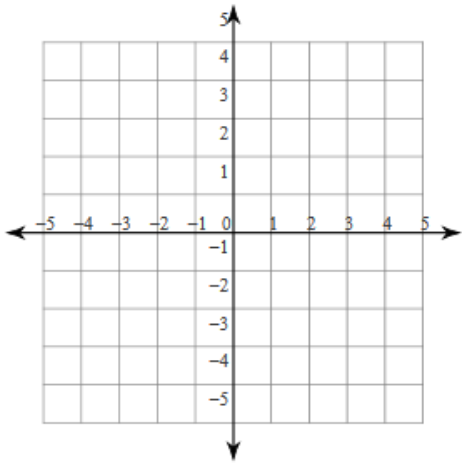
2) $y = \frac{1}{2}x + 2$
$y = \frac{1}{2}x - 3$



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

Kuta Software - Infinite Algebra 1 Name_____

Systems of Equations Word Problems

Date_____ Period____

1) Find the value of two numbers if their sum is 12 and their difference is 4.

$x+y=12$
$x-y=4$
$2x=16$
$x=8$

$8+y=12$
$-8 \quad -8$
$y=4$

$(8,4)$

2) The difference of two numbers is 3. Their sum is 13. Find the numbers.

3) Flying to Kampala with a tailwind a plane averaged 158 km/h. On the return trip the plane only averaged 112 km/h while flying back into the same wind. Find the speed of the wind and the speed of the plane in still air.

4) The school that Stefan goes to is selling tickets to a choral performance. On the first day of ticket sales the school sold 3 senior citizen tickets and 1 child ticket for a total of $38. The school took in $52 on the second day by selling 3 senior citizen tickets and 2 child tickets. Find the price of a senior citizen ticket and the price of a child ticket.

x - senior $8
y - child $14

$3x+y=38$ $\cdot -1$
$3x+2y=52$

$-3x-y=-38$
$3x+2y=52$
$y=14$

$3x+2(14)=52$
$3x+28=52$
$-28 \quad -28$
$3x=24$
$x=8$

5) The sum of the digits of a certain two-digit number is 7. Reversing its digits increases the number by 9. What is the number?

6) A boat traveled 210 miles downstream and back. The trip downstream took 10 hours. The trip back took 70 hours. What is the speed of the boat in still water? What is the speed of the current?

7) The state fair is a popular field trip destination. This year the senior class at High School A and the senior class at High School B both planned trips there. The senior class at High School A rented and filled 8 vans and 8 buses with 240 students. High School B rented and filled 4 vans and 1 bus with 54 students. Every van had the same number of students in it as did the buses. Find the number of students in each van and in each bus.

8) The senior classes at High School A and High School B planned separate trips to New York City. The senior class at High School A rented and filled 1 van and 6 buses with 372 students. High School B rented and filled 4 vans and 12 buses with 780 students. Each van and each bus carried the same number of students. How many students can a van carry? How many students can a bus carry?

van - $v = 18$
bus - $b = 59$

$v + 6b = 372$ | -4
$4v + 12b = 780$

$v + 6(59) = 372$
$v + 354 = 372$
$-354 \quad -354$
$v = 18$

$-4v - 24b = -1488$
$4v + 12b = 780$
$-12b = -708$
$\frac{-12b}{-12} = \frac{-708}{-12}$
$b = 59$

9) Brenda's school is selling tickets to a spring musical. On the first day of ticket sales the school sold 3 senior citizen tickets and 9 child tickets for a total of $75. The school took in $67 on the second day by selling 8 senior citizen tickets and 5 child tickets. What is the price each of one senior citizen ticket and one child ticket?

10) Matt and Ming are selling fruit for a school fundraiser. Customers can buy small boxes of oranges and large boxes of oranges. Matt sold 3 small boxes of oranges and 14 large boxes of oranges for a total of $203. Ming sold 11 small boxes of oranges and 11 large boxes of oranges for a total of $220. Find the cost each of one small box of oranges and one large box of oranges.

11) A boat traveled 336 miles downstream and back. The trip downstream took 12 hours. The trip back took 14 hours. What is the speed of the boat in still water? What is the speed of the current?