Systems of Equations & Inequalities

ADVANCED

I have included a voice recorded power point show that has automatic slide advancement. Please leave feedback if you find this helpful, and I will go back and add it to my other units.

Preview

I have also started adding detailed lesson plans to my units. Please leave feedback on if this addition is helpful to you!!

For Middle/High School Special Education

Advanced Algebra: Solving Systems of Equations and Inequalities Lesson Plan

Preparation

- Print out a vocabulary board for each student to use throughout unit
  - Laminate or place in page protector
- Book
  - Print out, laminate, and bind
  - OR your students can listen to the pre-recorded version
- Vocabulary cards
  - Print out a set of cards onto cardstock and laminate
  - Make one set for each student and also one for the teacher to use in I Spy games

Preassessment (do day 1 before starting lesson)

- Choose the form of the assessment that best fits the learning level of your students
- Give the assessment to assess what your students may already know
- I cannot emphasize enough how important this step is. If you want to see growth, this preassessment is so important!!

Teaching Tips

1. *Color Coding*: this is a really easy way to add more structure to a matching activity. Outline or color in an empty box or sorting label. Outline or color in the corresponding picture symbols the same colors. Becomes a color matching task.
   a. For more info, read more here: https://specialneedsforspecialkids.org/2015/09/05/using-color-coding-for-differentiation/
   b. I also have a blog post on differentiating one activity 3 ways: https://specialneedsforspecialkids.org/2018/10/22/differentiating-1-activity-3-ways-easily-and-effectively/
2. *Make you own copies of the activities*: Every day I review the activity we did yesterday. For that reason:
   a. I often complete the activity myself and often laminated it for easy review that I could use year after year.

Lesson Plans

18 days

Quick Look

Day	Activity	Day	Activity	Day	Activity
1	• Book • Solutions to Equations worksheets	7	• Book • Graphing inequalities worksheets	13	• Book • Possible values to systems of inequalities worksheets
2	• Book • Solutions to Equations worksheets	8	• Book • Graphing inequalities worksheets	14	• Book • Possible values to systems of inequalities worksheets
3	• Book • Solutions to Equations worksheets	9	• Book • Graphing inequalities worksheets	15	• Book • Possible values to systems of inequalities worksheets
4	• Book • Solutions to Equations worksheets	10	• Book • Graphing inequalities worksheets	16	• Book • Vocab cards cut & paste • Close worksheet
5	• Book • Solutions to Equations worksheets	11	• Book • Possible values to systems of inequalities worksheets	17	• Book • Vocab cards cut & paste • Close worksheet
6	• Book • Graphing inequalities worksheets	12	• Book • Possible values to systems of inequalities worksheets	18	• Assessment • Sudoku puzzle

Day 3

Activity	Notes	Materials
Read or listen to a recording of the book (10 minutes)	• Read through the story, asking lots of questions • Continue to make connections between book and vocabulary board	• Book • Vocabulary board

Vocabulary cards I Spy Game (10 minutes)	• To play this game see description on day 2
	• Today, try to give clues about the card your student needs to find
	  ○ Read definition
	  ○ Show real photo that relates to card from book (if applicable)
	  ○ Describe the picture
	• Discuss relevant points on the card
	  ○ You can also play this game in this manner having them find the symbol on their vocabulary board
		• Vocabulary cards (student set and teacher set)
		• Vocabulary board

System of equations review (5 minutes)	• Review the worksheet completed yesterday	• System of equations worksheet
Id solutions to systems of equations (10 minutes)	• Do 2 of the worksheets where students identify the solution to 2 equations that are graphed for them. • You can choose to use either the regular or differentiate set (or both!!)	• Worksheet •
Sharing (10 minutes)	• Each student shares one of their finished worksheets with the group using the communication method of their choice	• Completed worksheets • Communication devices

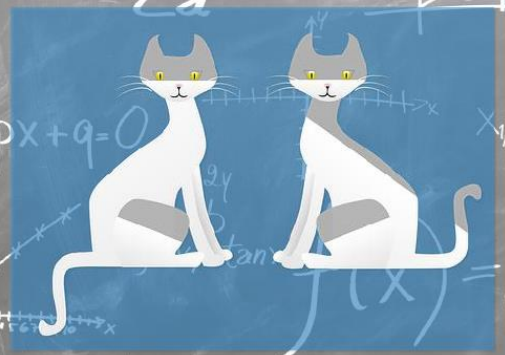
Systems are 2 or more sets of equations or inequalities that all related to one another and, when solved, can tell you what X and Y might be.

35 page book

Let's say you are making cupcakes for a bake sale at school. Your teacher gives you $20 to spend and you buy 6 boxes of cake mix and 4 containers of frosting.

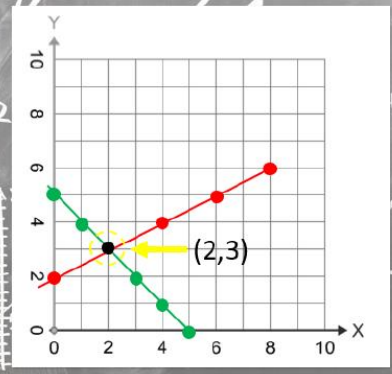
Since we won't actually be solving systems, what will we be doing? We will find the answers by looking at graphs!!

Systems have the same unknown variables whether you are using equations or inequalities. The X and the Y represent the same thing in both equations.



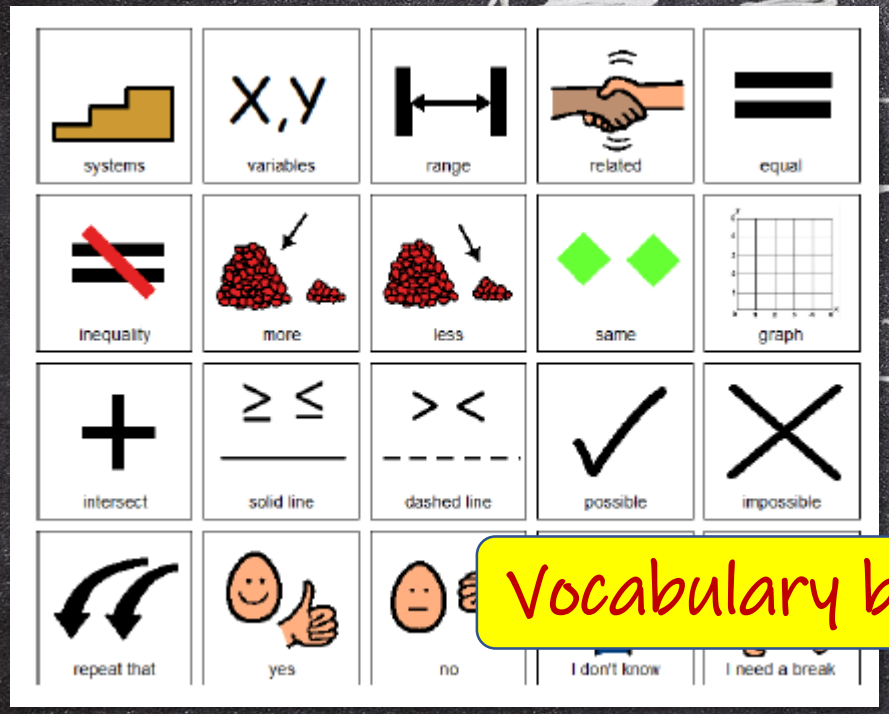
The bake sale goes so well, that your teacher asks to run out and buy more supplies. This time she only gives you $15. You were able to buy 4 boxes of cake mix and 3 more containers of frosting.

When you have a system that has two equations (those that have equal signs) then the answer for X and Y is where the 2 lines intersect.

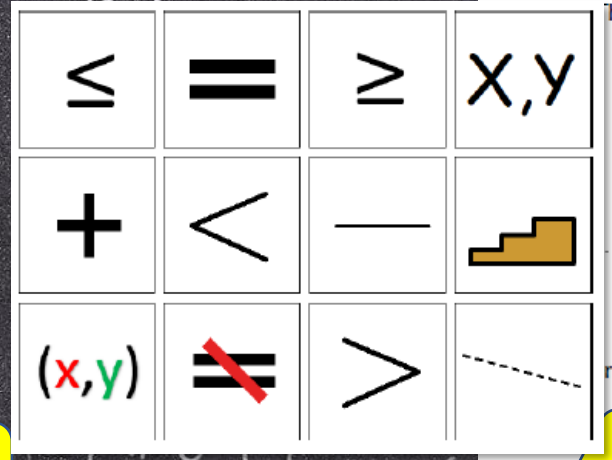


Y = -X+5

Y = ½ X +2



Vocabulary board



intersect

When graphed, where 2 equations ... that point is the value of the variables.

ordered pair

Set of numbers that relate to a point on a graph.

greater than

... that is larger/bigger than the variable.

less than

A number that is smaller than the variable.

51

Cut & Paste

12 vocab cards

variable

An unknown quantity in an expression or equation represented by a letter.

X, Y

inequality

An expression that does not have a single answer; uses one of the following symbols: < > ≤ ≥

equation

Expression with one of the following signs: = < > ≤ ≥.

system

Two of more problems that are related and have the same variables.

An expression that does not have a single answer; uses one of the following symbols: < > ≤ ≥

A number that is smaller than the variable.

When graphed, where 2 equations cross. That point is the value of the variables.

Greater than or equa...

≥

...er than or equal to

≤

solid line

dashed line

57

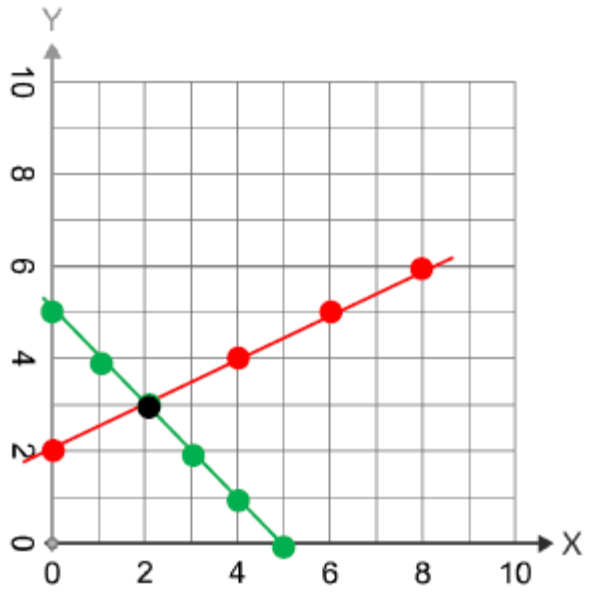
10 of each

Find where the two lines intersect, and write the ordered pair and the values of X and Y which is the solution to the following system.

$Y = -X+5$

$Y = \frac{1}{2}X + 2$

Answer: __,__
X = __
Y = __



Id solutions to Equations

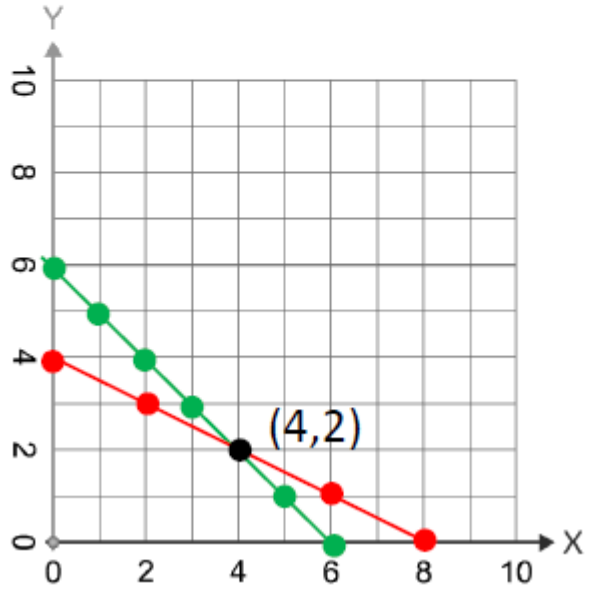
Differentiated

Find where the two lines intersect, and write the ordered pair and the values of X and Y which is the solution to the following system.

$X+Y=6$

$X+2Y=8$

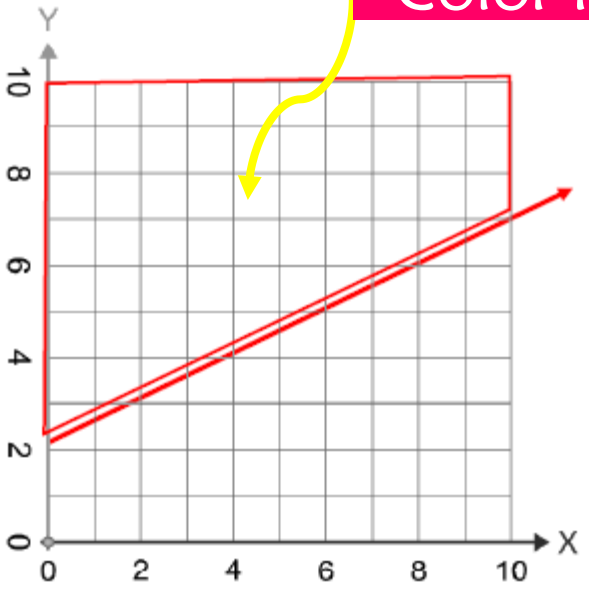
Answer: 4,2
X = __
Y = __



1. Circle the inequality sign
2. Shade the graph showing possible values for the variable.

$Y \geq \frac{1}{2}X + 2$

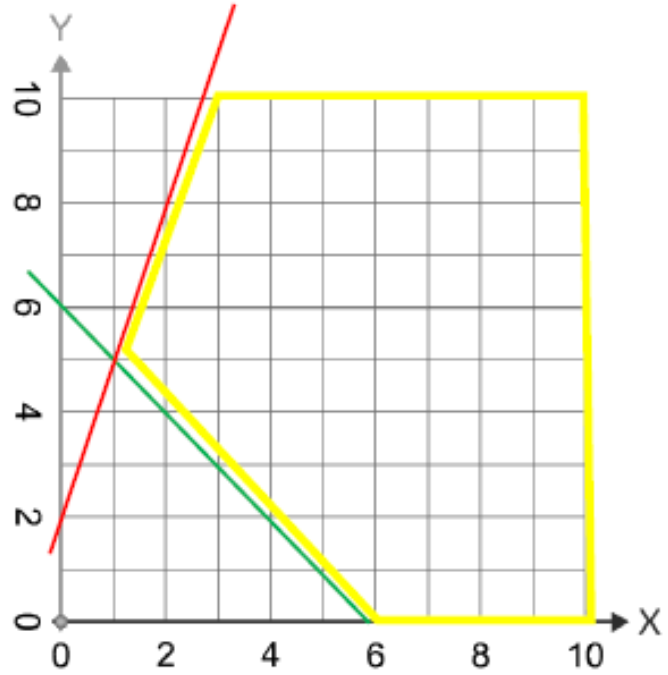
Color in



Graphing Inequalities

1. Circle each inequality sign.
2. Shade in where the 2 inequalities overlap.
3. Draw 3 points that would be possible values for X and Y.
4. Write one possible ordered pair in the box below.

$X+Y \geq 6$ $-3X+Y \leq 2$

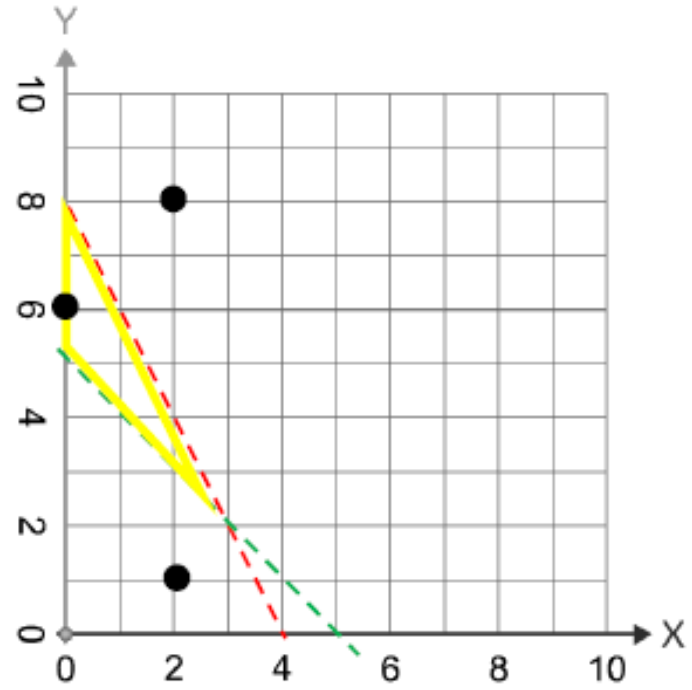


_____, _____

10 of each

1. Circle each inequality sign.
2. Shade in where the 2 inequalities overlap.
3. Circle any points that would be possible values for X and Y.

$X+Y > 5$ $2X+Y < 8$



Finding possible values of inequalities

Differentiated

Systems

1. A system can involve [ ] or [ ]

2. In any system the variables are the [ ] .

3. In a system of equations, you can find the [ ] value of each variable.

4. In a system of inequalities, you can find a [ ] of possible values.

5. One way to solve a system is to use a [ ] .

Systems

6. When graphing equations, the answer is where the 2 lines [ ]

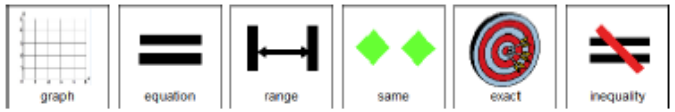
7. When graphing [ ] the possible answers are in the shaded region.

8. We use a [ ] line when graphing inequalities with < or >.

9. We use a [ ] line when graphing inequalities with ≤ or ≥.

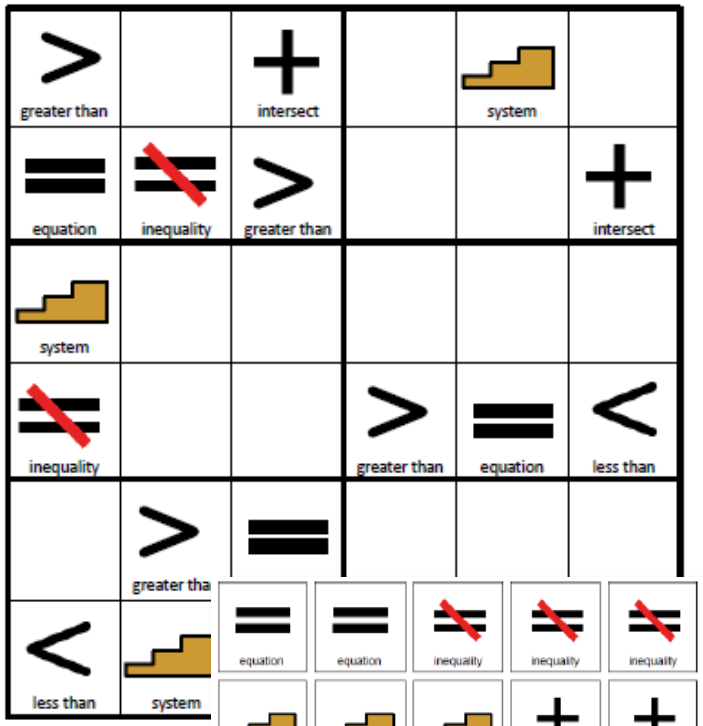
10. When graphing equations, you always use a [ ] line.

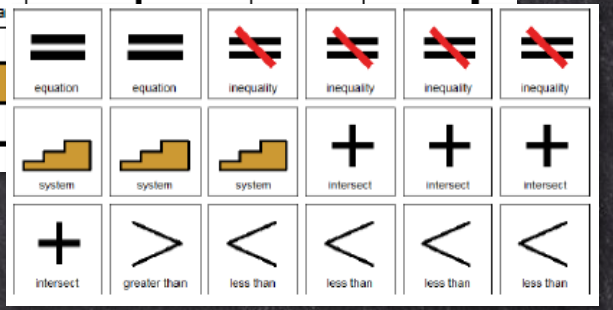
Systems (page 1)



Systems (page 2)

Systems





Close worksheets

Sudoku 4x4 also included

1. How many problems are in a system of equations?

2. What is the same in a system?

3. What was one tool we solved systems?

4. With a system of equations, the value of X and Y is where the lines:

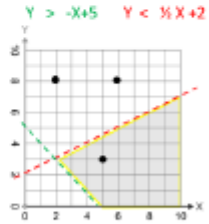
5. What is the value of X in this system?

6. True or False. With a system of inequalities, you get a range of answers rather than an exact value.

7. What type of line would you use to graph Y > 3?

8. What type of line would you use to graph X ≤ 5?

for

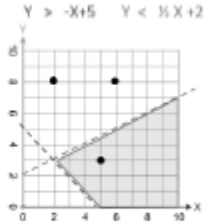


the book, what were the
needed)

7. What type of line would you use to graph Y > 3?
   A. dashed
   B. bumpy
   C. solid

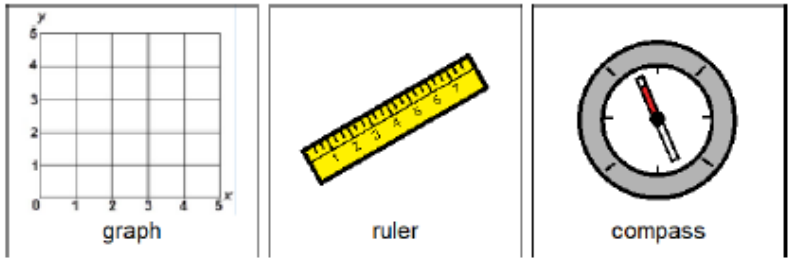
8. What type of line would you use to graph X ≤ 5?
   A. dashed
   B. bumpy
   C. solid

9. Circle the possible values (dots) for this system of inequalities.

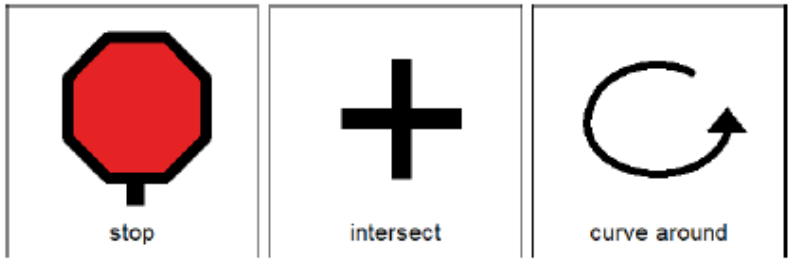


10. In our cupcake example from the book, what were the 2 variables? (reread the problem if needed)
   A. cake mix
   B. container of frosting
   C. shopping cart

Q 3



Q 4



Assessments :
3 versions