

READY, SET, GO!

Name _____

Period _____

Date _____

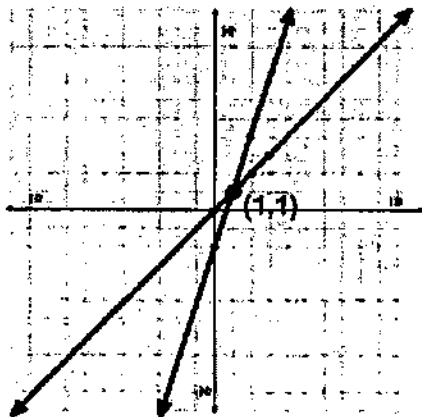
READY

Topic: Solving system of equations by graphing.

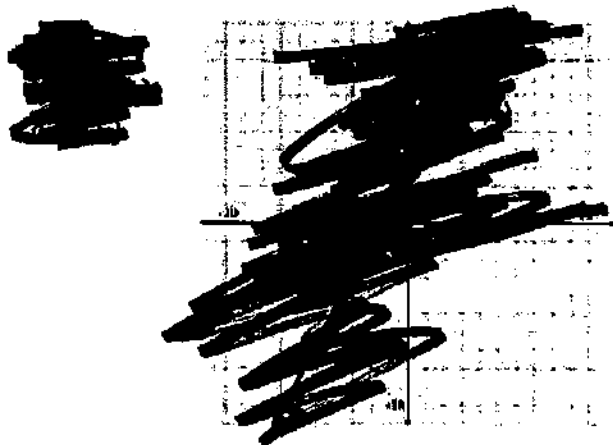
Substitute the given points into both equations to determine which ordered pair satisfies the system of linear equations. Graph both equations and label the point of intersection to verify the solution.

1. $y = 3x - 2$ and $y = x$

- a. $(0, -2)$
- b. $(2, 2)$
- c. $(1, 1)$

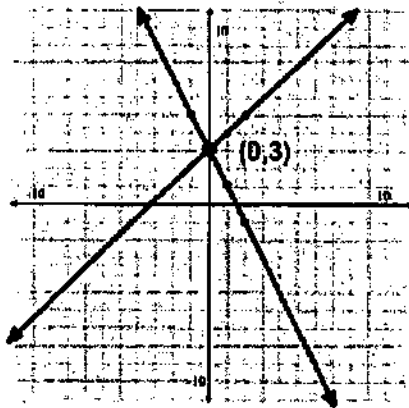


2. $y = 2x + 3$ and $y = x + 5$



Solve the following systems by graphing. Check the solution by evaluating both equations at the point of intersection.

3. $y = x + 3$ and $y = -2x + 3$



Check: $3 = 0 + 3$
 $3 = 3$ ✓
 $3 = -2(0) + 3$
 $3 = 3$ ✓

4. $y = 3x - 8$ and $y = -x$



SET

Topic: Determining possible solutions to inequalities

5. A theater wants to take in at least \$2000 for the matinee. Children's tickets cost \$5 each and adult tickets cost \$10 each. The theater can seat up to 350 people. Find five combinations of children and adult tickets that will make the \$2000 goal. Answers will vary. Examples:

Children	Adults	Total	Revenue
0	350	350	\$3500
50	300	350	\$3250
100	200	300	\$2500

Children	Adults	Total	Revenue
50	200	250	\$2250
200	150	350	\$2500
350	0	350	\$1750

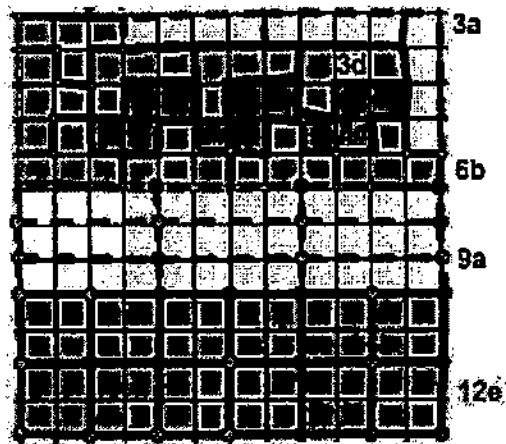
6. The Utah Jazz scored 102 points in a recent game. The team scored some 3-point shots, 2-point shots, and many free throws worth 1-point each. Find five combinations of baskets that would add up to 102 points. Answers will vary.

3-point shots	2-point shots	Free throws	Total
0	51	0	102
1	49	3	102
2	47	6	102
3	45	9	102
4	43	12	102

3-point shots	2-point shots	Free throws	Total
34	34	34	102
35	32	35	102
36	30	36	102
37	28	37	102
38	26	38	102

7. Use as many of the following shapes in any combination as you need to try to fill in as much of the 12 by 12 grid as you can. You may rotate or reflect a shape if it helps. Write your answer showing how many of each shape you used using the letters that identify shape.

Example: 3a, 5b, 10c, 2d, 6e



Answers will vary. Example: 12a, 6b, 3c, 3d, 12e

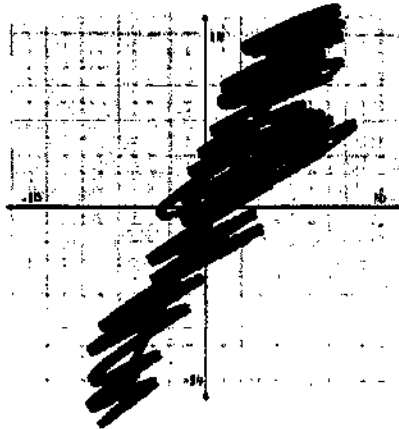
GO

Topic: Graphing linear equations and determining if a given value is a solution, arithmetic sequences

Graph each equation below; then determine if the point (3,5) is a solution to the equation. Find two points other than (3,5) that are solutions to the equation. Show these points on the graph.

8. $y = 2x - 1$

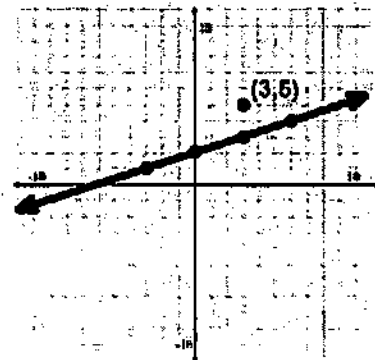
Answer:
Possible points.



9. $y = \frac{1}{3}x + 2$

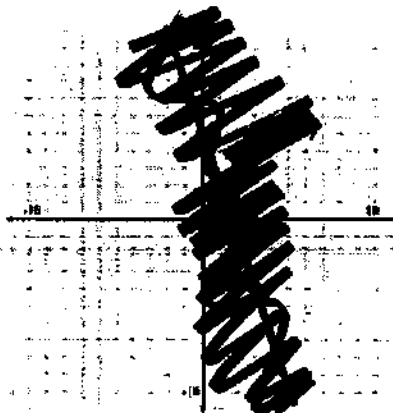
No

Answer:
Possible points.
(6,4), (3,3),
(0,2), (-3,1)
...



10. $y = -3x + 5$

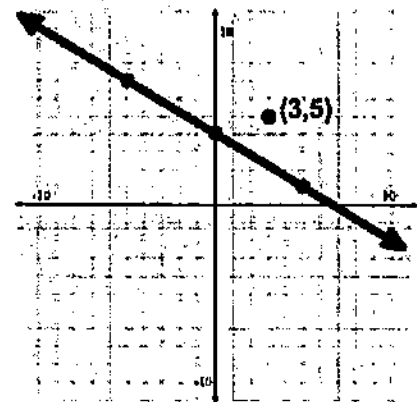
Answer:
Possible points.



11. $y = \frac{-3}{5}x + 4$

No

Answer:
Possible points.
(-5,7), (0,4),
(5,1)...



The tables below represent different arithmetic sequences. Fill in the missing numbers. Then write the explicit equation for each.

12.

term (x)	1	2	3	4
value (y)				

Equation:

13.

term(x)	1	2	3	4	5	6	7	8	9	10	11	12	13
term(y)	17	15	13	11	9	7	5	3	1	-1	-3	-5	-7

Equation: **Answer:** $f(x) = -2x + 19$

14.

term (x)	1	2	3	4	5	6	7
value (y)							

Equation: **Answer:** ~~off~~

15. Each of the sequences above begins and ends with the same number. Would the graph of each sequence represent the same line? Justify your thinking.

Answer: No. They would not be the same graph because each equation has a different slope and y-intercept.

16. If you graphed each of these sequences and made them continuous by connecting each point, where would they intersect?

~~They would intersect at the point (1, 19) and (13, -7).~~



READY, SET, GO!

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READY

Topic: Determining if given values are solutions to a two variable equation.

Identify which of the given points are solutions to the following linear equations.

1. $3x + 2y = 12$

a. (2, 4)

b. (3, 2)

c. (4, 0)

d. (0, 6)

2. $5x - y = 10$



3. $-x + 6y = 10$

a. (-4, 1)

b. (-22, -2)

c. (2, 2)

d. (10, 0)

Find the value that will make each ordered pair be a solution to the given equation.

4. $x + y = 6$



5. $2x + 4y = 8$

a. (2, 1)

b. (0, 2)

c. (4, 0)

6. $3x - y = 8$



SET

Topic: Graphing linear inequalities

Graph the following inequalities on the coordinate plane. Name one point that is a solution to the inequality and one point that is not a solution. Show algebraically and graphically that your points are correct.

Chosen points will vary.

7. $y \leq 3x + 4$

Answer:

(1, 1) is a solution

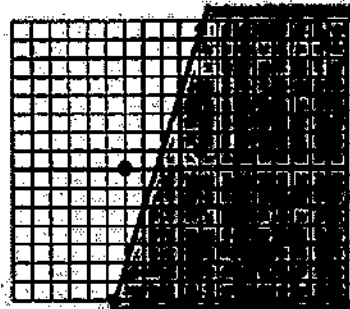
$1 \leq 3(1) + 4$

$1 \leq 7$ True

(-3, 0) not a solution

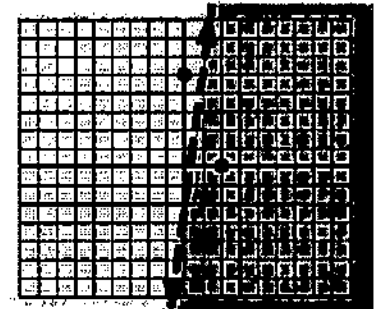
$-3 \leq -12 + 4$

$-3 \leq -8$ False



8. $y < 7x - 2$

Answer:



9. $y > \frac{-3}{5}x + 2$

Answer:

(0, 3) is a solution

$3 > \frac{-3}{5}(0) + 2$

$3 > 2$ True

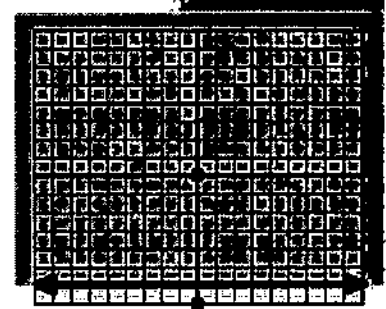
(0, 0) not a solution

$0 > \frac{-3}{5}(0) + 2$

$0 > 2$ False



10. $y \geq -6$



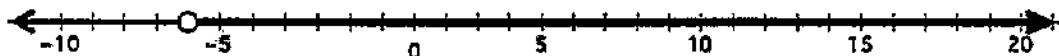
GO

Topic: Solving inequalities

Follow the directions for each problem below. (Show your work!)

11. $10 - 3x < 28$

- a) Solve for
- x
- . Then graph the solution on the number line. Answer:
- $x > -6$



- b) Select an
- x
- value from your graph of the solution of the inequality. Replace
- x
- in the original inequality
- $10 - 3x < 28$
- with your chosen value. Does the inequality hold true?

Answer: $x = 1$, $10 - 3(1) < 28$, $7 < 28$ The inequality holds true.

- c) Select an
- x
- value that is outside of the solution set on your graph. Replace
- x
- in the original inequality
- $10 - 3x < 28$
- with your chosen value. Does the inequality still hold true?

Answer: $x = -10$, $10 - 3(-10) < 28$, $40 > 28$ The inequality is false.

12. $4x - 2y \geq 6$

- a) Solve for
- y
- . Answer:
- ~~_____~~
-
- b) Rewrite your inequality as an equation. In other words, your solution will say
- $y =$
- , instead of
- $y \geq$
- or
- $y \leq$
- . When you use the equal sign, the expression represents the equation of a line. Answer:
- ~~_____~~

- c) Graph the line that goes with your equation.

- d) Name the
- y
- intercept. Answer:
- ~~_____~~

- e) Identify the slope. Answer:
- ~~_____~~

- f) Select a point that is above the line. (,) Answer:
- ~~(,)~~

- g) Replace the
- x
- value and
- y
- value of your chosen point in the inequality
- ~~_____~~

- h) Is the inequality still true? Answer:
- ~~_____~~

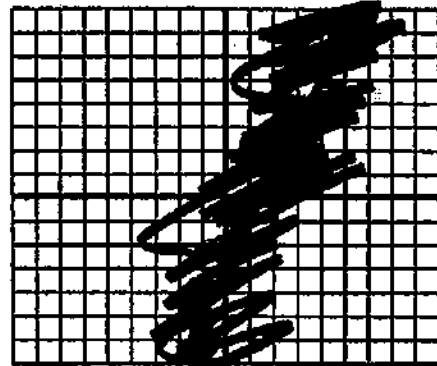
- i) Select a point that is below the line. (,) Answer:
- ~~(,)~~

- j) Replace the
- x
- value and
- y
- value of your chosen point in the inequality
- $4x - 2y \geq 6$
- . Answer:
- ~~_____~~

- k) Is the inequality still true? Answer:
- ~~_____~~

- l) Explain which side of the line should be shaded. Answer:
- ~~_____~~

- m) Decide whether the line should be solid or dotted. Justify your decision.

Answer: ~~_____~~

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READY

Topic: Determining points that are solutions to a system of equations.

Three points are given. Each point is a solution to at least one of the equations. Just one point satisfies both equations. (This is the solution to the system!) Find and justify which point is a solution to both equations. Also justify which points are not solutions.

1. $\begin{cases} y = 2x - 3 \\ y = -x + 3 \end{cases}$

Justification (solution)
 b. $1 = 2(2) - 3$
 $1 = 1$
 $1 = -(-2) + 3$
 $1 = 1$

a. $(-2, 5)$
 b. $(2, 1)$
 c. $(4, 5)$

Justification (not a solution):
 a. $5 = 2(-2) - 3$
 $5 \neq -7$
 $5 = -(-2) + 3$
 $5 = 5$
 c. $5 = 2(4) - 3$
 $5 = 5$
 $5 = -(-4) + 3$
 $5 \neq -1$

3. $\begin{cases} y = 2 \\ y = -4x - 6 \end{cases}$

Justification (solution)
 c. $2 = 2$
 $2 = -4(-2) - 6$
 $2 = 2$

a. $(7, 2)$
 b. $(2, -14)$
 c. $(-2, 2)$

Justification (not a solution):
 a. $2 = 2$
 $2 = -(7) - 6$
 $2 \neq -13$
 b. $-14 \neq 2$
 $-14 = -4(2) - 6$
 $-14 \neq -14$

2. $\begin{cases} y = 3x + 3 \\ y = -x + 3 \end{cases}$

4. $\begin{cases} y = 2x + 4 \\ x + y = -5 \end{cases}$

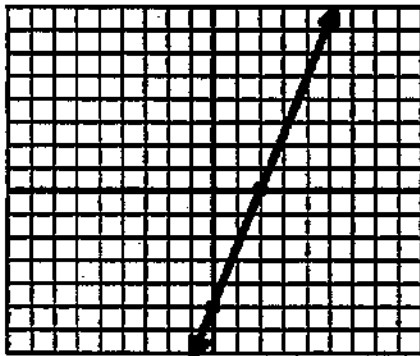
SET

Topic: Graphing linear equations written in standard form

Graph the following equations by finding the x-intercept and the y-intercept.

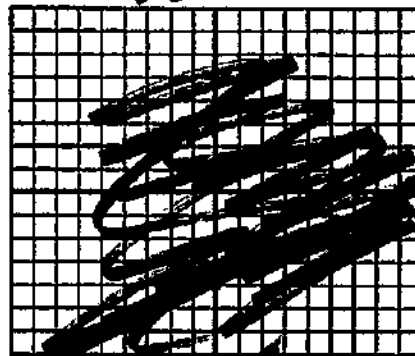
5. $5x - 2y = 10$

x-intercept: $(2, 0)$ y-intercept: $(0, -5)$



6. $3x - 6y = 24$

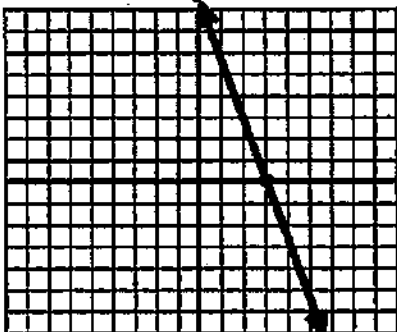
x-intercept: [blacked out] y-intercept: [blacked out]



SECONDARY MATH I // MODULE 5
SYSTEMS - 5.3

5.3

7. $6x + 2y = 18$

x-intercept: $(3, 0)$ y-intercept: $(0, 9)$ 

8. $-2x + 7y = -14$

x-intercept: y-intercept: 

GO

Topic: Adding and multiplying fractions

Add. Reduce your answers but leave as improper fractions where applicable.

9. $\frac{3}{4} + \frac{1}{8}$

Answer: $\frac{7}{8}$

10. $\frac{3}{5} + \frac{7}{10}$

Answer:

11. $\frac{2}{3} + \frac{1}{4}$

Answer: $\frac{11}{12}$

12. $\frac{4}{7} + \frac{8}{21}$

Answer:

Multiply. Reduce your answers but leave as improper fractions where applicable.

13. $\frac{3}{4} \times \frac{2}{9}$

Answer: $\frac{1}{6}$

14. $\frac{4}{7} \times \frac{7}{10}$

Answer:

15. $\frac{5}{4} \times \frac{2}{9}$

Answer: $\frac{5}{18}$

16. $\frac{3}{7} \times \frac{8}{21}$

Answer:

READY, SET, GO!

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READY

Topic: Writing linear equations in standard form and slope-intercept form.

Rewrite the given equation so that they are in slope-intercept form. ($y = mx + b$)

1. $7x - 14y = -56$

Answer: $y = \frac{1}{2}x + 4$

2. $-8x - 2y = 6$

Answer: _____

3. $15x + 9y = 45$

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

Rewrite the given equations so that they are in standard form.
($Ax + By = C$, where A, B, and C are whole numbers and A is positive.)

4. $y = 7x - 3$

Answer: _____

5. $y = 2x + 9$

Answer: $2x - y = -9$

6. $y = -4x - 11$

Answer: _____

7. $y = \frac{1}{2}x + 8$

Answer: $x - 2y = -16$

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

Answer: _____

9. $y = -\frac{1}{6}x + \frac{2}{3}$

Answer: $x + 6y = 4$

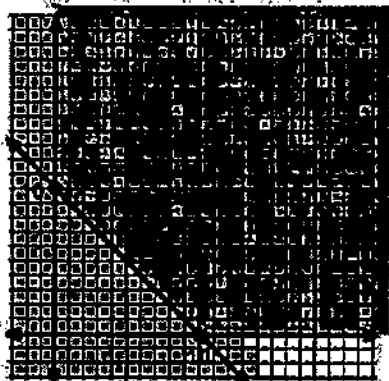
SET

Topic: Writing inequalities from a real world problem. Graphing inequalities.

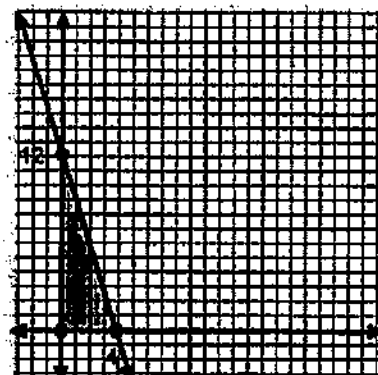
10. On a final for a creative writing course, Ben was required to write a combination of at least 10 poems or paragraphs. Ben knew that each poem would take him 30 minutes to write while a paragraph would only take 10 minutes. Ben was given two hours to complete the exam.

- a. Write an inequality to model each constraint. (Hint: One constraint is time and the other is the number of needed items. Let x be the number of poems written and y be the number of paragraphs written.)
- b. Graph each inequality on a separate coordinate grid and shade the solution set for each.

Answer: _____



Answer: _____



GO

Topic: Substituting a value to check if it's a solution

Determine whether $h = 3$ is a solution to each problem.

11. $3(h - 4) = -3$

Answer: Yes

12. $3h = 2(h + 2) - 1$

Answer: No

13. $2h - 3 = h + 6$

Answer: No

14. $3h > -3$

Answer: Yes

15. $\frac{3}{5} \leq h \times \frac{1}{5}$

Answer: Yes

16. $\frac{3}{5} > h \times \frac{1}{6}$

Answer: No

Determine the value of x that makes each equation true.

17. $4x - 2 = 8$

Answer: $x = \frac{5}{2}$

18. $3(x + 5) = 20$

Answer: No

19. $2x + 3 = 2x - 5$

Answer: No solutions

20. $4(6x - 1) = 3(8x + 5) - 19$

Answer: No solutions

READY, SET, GO!

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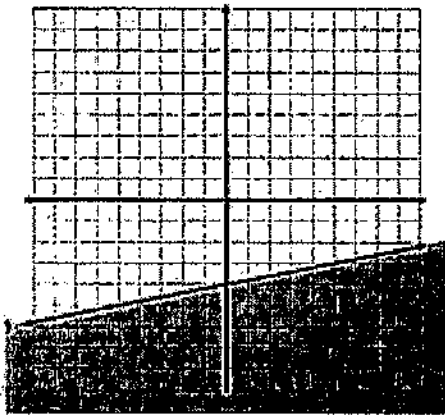
Date _____

READY

Topic: Graphing two variable inequalities.

For each inequality and graph, pick a point and use it to determine which half-plane should be shaded; then shade the correct half-plane.

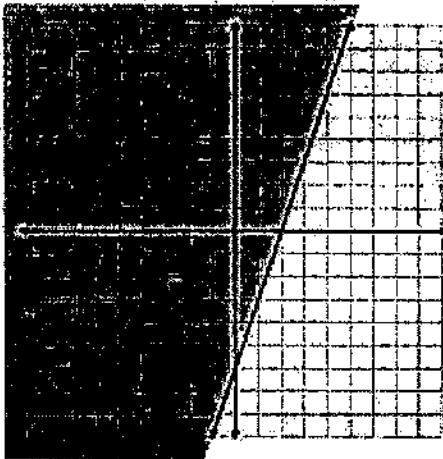
1. $y \leq \frac{1}{5}x - 4$



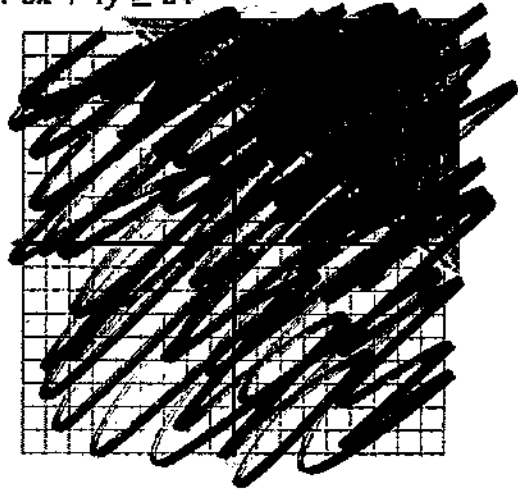
2. $y \geq -3x + 5$



3. $5x - 2y \leq 10$



4. $3x + 4y \geq 24$

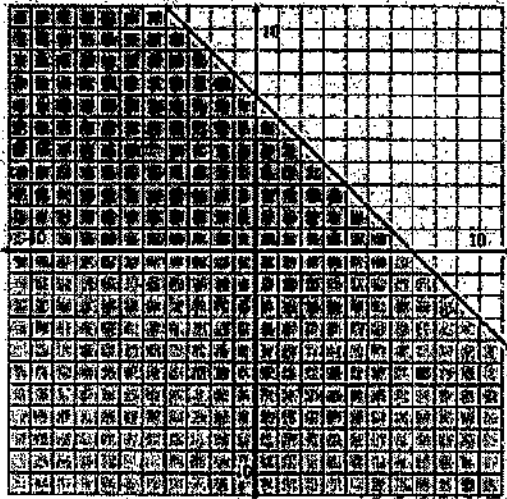


SET

Topic: Writing two variable inequalities

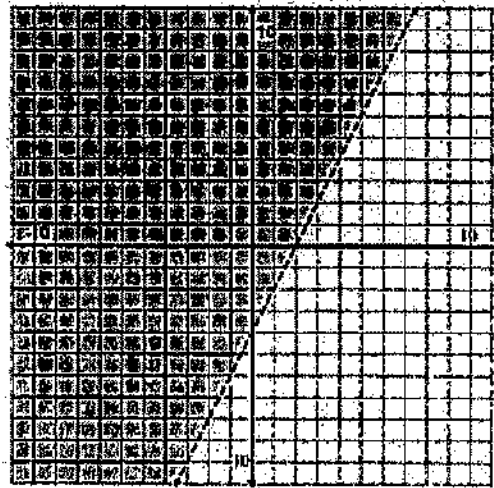
Use the graph to write the inequality that represents the shaded region.

5.



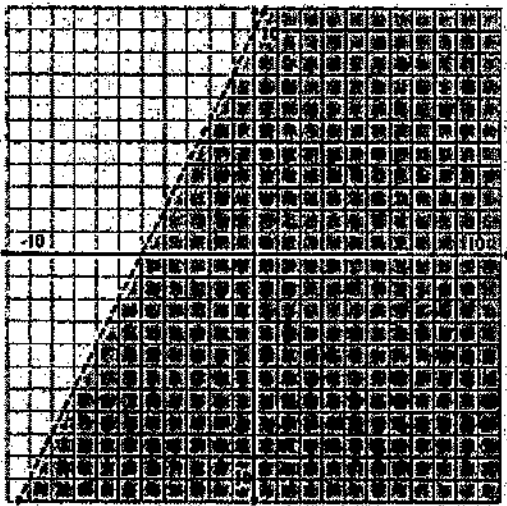
Answer: $y \leq -x + 7$

6.



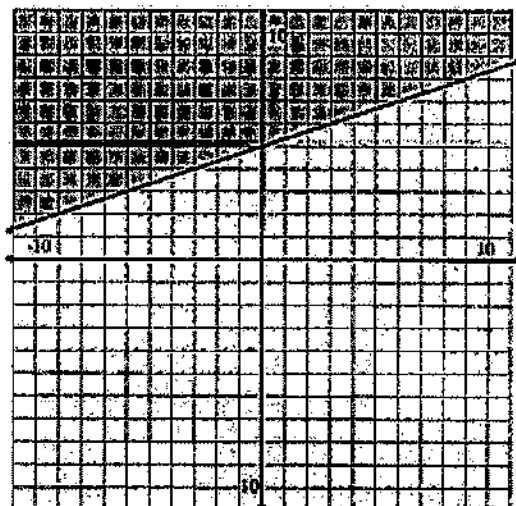
Answer: ~~_____~~

7.



Answer: $y < 2x + 10$

8.



Answer: ~~_____~~

GO

Topic: Proportional relationships

For each proportional relationship below, one representation is provided. Create the remaining representations and explain any connections you notice between representations.

9. Equation: Answer: $y = 8x$

Table

Days	Cost
1	8
2	16
3	24
4	32

Graph

Create a context
Answers will vary. Example: It costs \$8 per day for Annie to attend

10. Equation: Answer: [REDACTED]

Table

Answer: [REDACTED]

Create a context

[REDACTED]

Graph

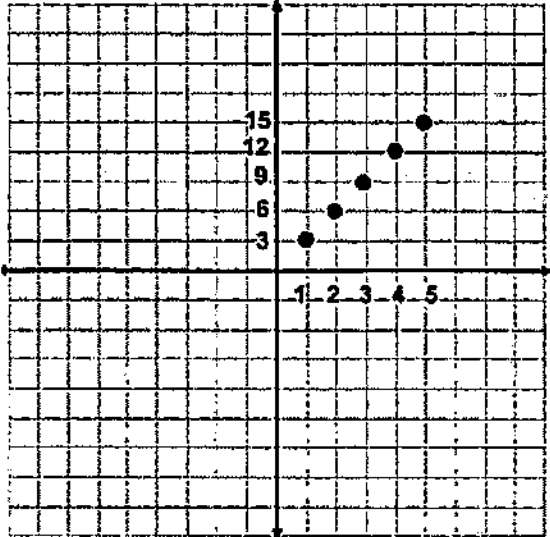
11. Equation: $y = 3x$

Graph

Table

Answer:

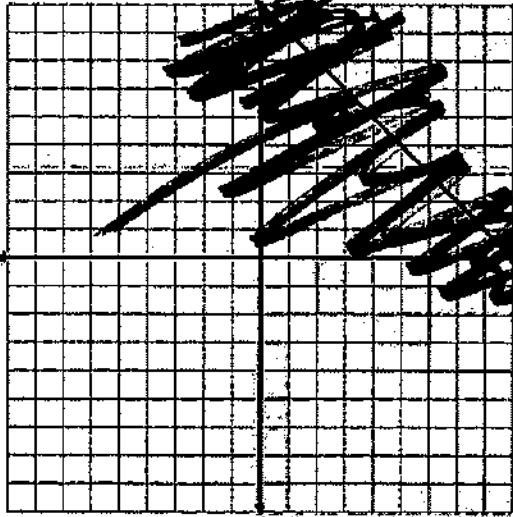
Day	Meals
1	3
2	6
3	9
4	12
5	15



Create a Context
Answers will vary. Example:
I eat 3 meals per day.

12. Equation: _____ Answer: _____

Table



Create a Context

READY, SET, GO!

Name _____

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READY

Topic: Using substitution to find a missing value.

Substitute the given value of x into the equation to find the value of y .

1. $5x - 9y = 73; x = 2$

Answer: $y = -7$

2. $-4x + 9y = 16; x = 5$

Answer: _____

3. $3x - 8y = 1; x = -5$

Answer: $y = -2$

4. $-14x + 5y = 51; x = 1$

Answer: _____

5. $9x - 7y = 21; x = 0$

Answer: $y = -3$

6. $12x - 15y = -42; x = \frac{1}{4}$

Answer: _____

Use the given value to find the value of the other variable that is not provided.

7. $5a + 2b = -37$

$b = -1$

Answer: $a = -7$

8. $13f - 7g = 10$

$f = -3$

Answer: _____

9. $2m + 3z = -22$

$z = -9$

Answer: $m = \frac{5}{2}$

SET

Topic: Examining the impact of the direction of the inequality symbol

10. Graph $y > \frac{3}{4}x - 2$ and $y < \frac{3}{4}x + 3$ on the grid at the right.

11. What is the relationship between the two lines in your graph?

Answer: They are parallel.

12. Name 3 points that satisfy both inequalities.

13. Now, graph $y < \frac{3}{4}x - 2$ and $y > \frac{3}{4}x + 3$ on the next grid at the right.

14. Can you name 3 points that satisfy both inequalities for this system?

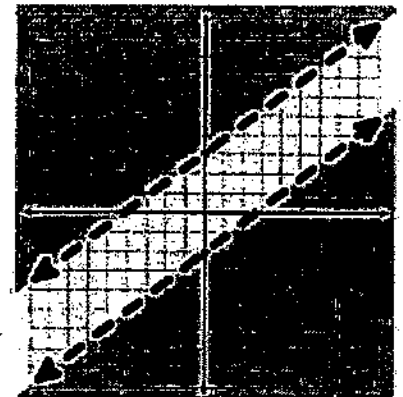
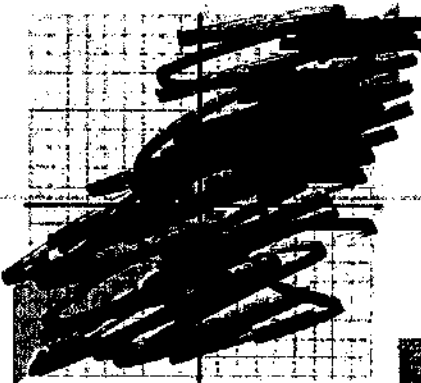
Answer: _____

15. Compare the graph for problem 10 with the graph for problem 13. How are they the same?

Answer: They have the same boundaries

How are they different?

Answer: They are shaded in the opposite direction so one has infinite solutions and the other has none.



GO

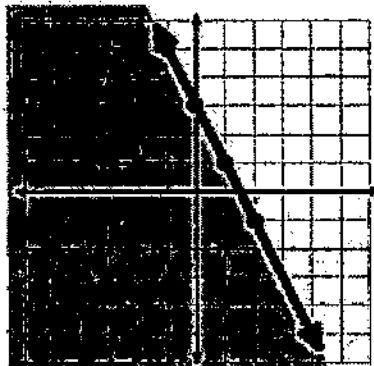
Topic: Graphing linear Inequalities

Graph each inequality.

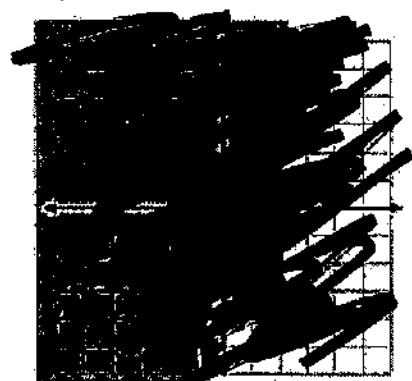
16. $y \leq 3x - 4$



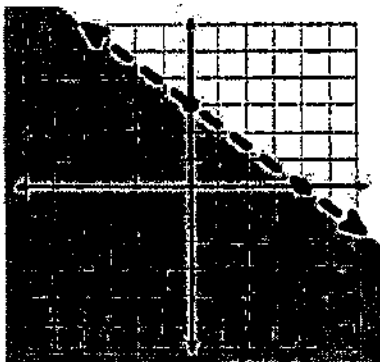
17. $y \leq -2x + 3$



18. $y > 4x - 3$



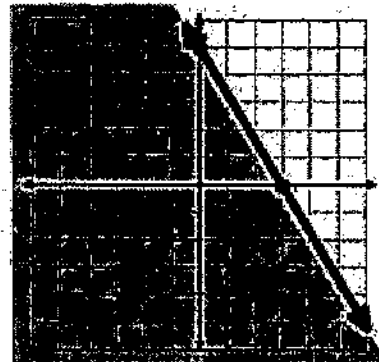
19. $3x + 4y < 12$



20. $6x + 8y \leq 24$



21. $5x + 3y \leq 15$



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READY

Topic: Pythagorean theorem

An easy way to check if a triangle contains a 90° angle (also called a right triangle) is to use the Pythagorean theorem. You may remember the theorem as $a^2 + b^2 = c^2$, where c is the length of the longest side (the hypotenuse) and a and b are the lengths of the two shorter sides.

Identify which lengths make a right triangle. Example: Given 5, 12, 13

Replace a , b , and c with the numbers ($5^2 + 12^2 = 13^2$) \rightarrow ($25 + 144 = 169$) \rightarrow ($169 = 169$)

Since $169 = 169$, a triangle with side lengths of 5, 12, and 13 must be a right triangle.

Do these numbers represent the sides of a right triangle? Write YES in the boxes that apply.

1. 9, 40, 41 Yes	2. 3, 4, 5 	3. 6, 7, 8 No	4. 20, 21, 29
5. 9, 12, 15 Yes	6. 10, 11, 15 	7. 6, 8, 10 Yes	8. 8, 15, 17

SET

Topic: Solving systems of equations using substitution.

Solve each system of equations using substitution. Check your solution in both equations.

In this problem, substitute $(x + 1)$ in place of y in the second equation.

$$9. \begin{cases} y = x + 1 \\ x + 2y = 8 \end{cases}$$

Answer: (2,3)

Check:

$$\begin{aligned} 3 &= 2 + 1 \\ 3 &= 3 \\ 2 + 2(3) &= 8 \\ 8 &= 8 \end{aligned}$$

$$11. \begin{cases} x = 9 - 2y \\ 3x + 5y = 20 \end{cases}$$

Answer: (-5,7)

Check:

$$\begin{aligned} -5 &= 9 - 2(7) \\ -5 &= -5 \\ 3(-5) + 5(7) &= 20 \\ -15 + 35 &= 20 \\ 20 &= 20 \end{aligned}$$

In this problem, substitute $(3 + y)$ in place of x in the first equation.

$$10. \begin{cases} y + 2x = 7 \\ x = 3 + y \end{cases}$$

Answer:

Check:

$$12. \begin{cases} y = 2x - 4 \\ 3y + 21x = 15 \end{cases}$$

Answer:

Check:

13.
$$\begin{cases} x = -1 - 2y \\ 3x + 5y = -1 \end{cases}$$

Answer: (3, -2)

Check:

$$\begin{aligned} 3 &= -1 - 2(-2) \\ 3 &= 3 \\ 3(3) + 5(-2) &= -1 \\ 9 - 10 &= -1 \\ -1 &= -1 \end{aligned}$$

14.
$$\begin{cases} y = 2x - 3 \\ x + y = -5 \end{cases}$$

Answer: [REDACTED]

Check: [REDACTED]

15. Tickets to a concert cost \$10 in advance and \$15 at the door. If 120 tickets were sold for a total of \$1390, how many of the tickets were purchased in advance?

Answer: 82 advance tickets

GO

Topic: Solving one variable inequalities

Solve the following inequalities. Write the solution set in *interval notation* and graph the solution set on a number line.

16. $4x + 10 < 2x + 14$

Answer: [REDACTED]

17. $2x + 6 > 55 - 5x$

Answer: $x > 7, (7, \infty)$

18. $2\left(\frac{x}{4} + 3\right) > 6(x - 1)$

Answer: [REDACTED]

19. $9x + 4 \leq -2\left(x + \frac{1}{2}\right)$

Answer: $x \leq \frac{5}{11}, (-\infty, \frac{5}{11}]$ Solve each inequality. Give the solution in *set builder notation* (e.g. $\{x \in \mathbb{R} | x < 2\}$).

20. $-\frac{x}{3} > -\frac{10}{9}$

Answer: [REDACTED]

22. $\frac{x}{4} > \frac{5}{4}$

Answer: [REDACTED]

24. $2x < 7x - 36$

Answer: [REDACTED]

21. $5x > 8x + 27$

Answer: $x < -9, \{x \in \mathbb{R} | x < -9\}$

23. $3x - 7 \geq 3(x - 7)$

Answer: $\{x \in \mathbb{R}\}$

25. $5 - x < 9 + x$

Answer: $x > -2, \{x \in \mathbb{R} | x > -2\}$

READY, SET, GO!

Name _____


Period _____

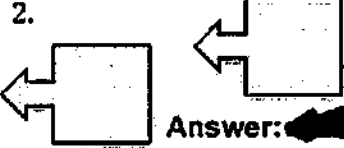
Date _____

READY

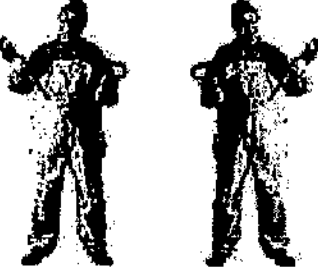
Topic: Transformations

Each set of pictures below shows a transformation from a "pre-image" to an "image." The word *transformation* in mathematics refers to how a figure can be moved. You might know transformations as "slide, flip, or turn" or by their formal names. Identify the transformation between the two figures by writing *slide*, *flip*, or *turn* next to the pair of images.


1. 
Answer: Turn

2. 
Answer: Slide

3. 
Answer: Turn

4. 
Answer: Turn

5. 
Answer: Slide

6. 
Answer: Turn

SET

Topic: Using equivalence to solve systems of equations

7. Mike and Gavin visited the amusement park with their science class on a school physics day. Their tickets were stamped each time they went on a ride. Mike and Gavin spent the entire afternoon going on their two favorite rides, the Rollercoaster and the Gravity free-fall. At the end of the day their tickets were stamped as shown.

What was the cost to ride on the Rollercoaster? **Answer: \$6.50**

What was the cost to ride on the Gravity free-fall? **Answer: \$5.50**

Physics Day Rides	
Rollercoaster	✓ ✓ ✓
Gravity free-fall	✓ ✓ ✓
Total	\$36.00

Mike's ticket

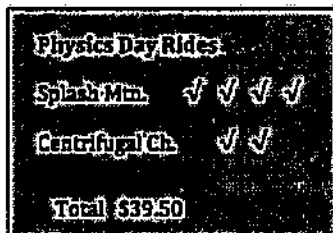
Physics Day Rides	
Rollercoaster	✓ ✓
Gravity free-fall	✓ ✓ ✓
Total	\$29.50

Gavin's ticket

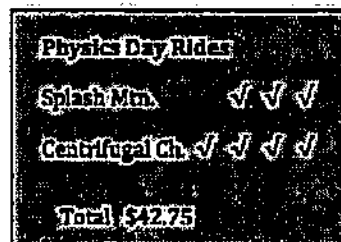
8. Mallory and Meg also attended the physics day with their school. Their favorite rides were Splash Mountain and the Centrifugal Chamber. Here are their stamped tickets at the end of the day. Find the cost of each ride.

Mallory's ticket

Answer:



Meg's ticket



GO

Topic: Graphing two variable, linear inequalities

Write an inequality to describe the given context. Graph each inequality on the provided grid. Then make a table that shows at least 3 possible combinations that will work for each situation.

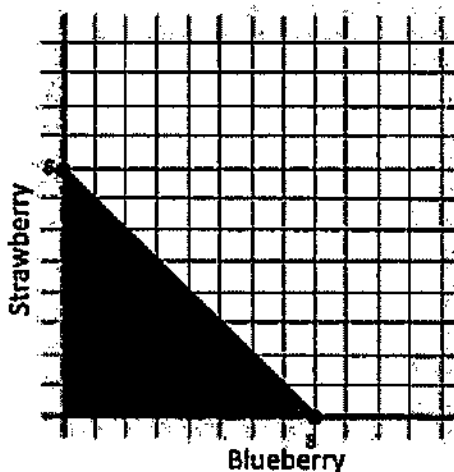
9. Dion has enough money to buy up to eight yogurts. His favorite flavors are blueberry and strawberry.

Answer: $b + s \leq 8$

blueberry = b and strawberry = s

Answers will vary. Possible answers:

b	s
1	7
2	6
4	3
2	3
4	2
5	1

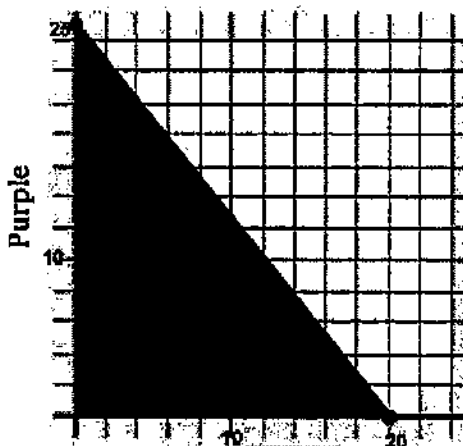
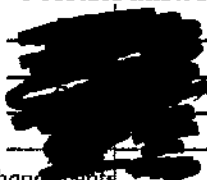


10. Shaniqua is buying a balloon bouquet. Her favorite colors are silver and purple. The silver balloons cost \$1.00 and the purple balloons cost \$0.80. How many of each color of balloon can she put in her bouquet if she doesn't spend more than \$20 on her bouquet?

Answer:



Answers will vary.
Possible answers:



READY, SET, GO!

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READY

Topic: Matching definitions of geometric figures.

Match the name of the figure with its geometric definition.

a. isosceles triangle	b. equilateral triangle	c. scalene triangle	d. right triangle
e. rectangle	f. rhombus	g. square	h. trapezoid

- h A quadrilateral with only one pair of parallel sides.
- g All of the sides of this triangle are the same length.
- f All of the sides of this quadrilateral are the same length.
- d This triangle has exactly one right angle.
- e This quadrilateral has four right angles.
- c None of the sides of this triangle are the same length.
- a This quadrilateral is both #3 and #5.
- b Only two sides of this triangle are the same length.

SET

Topic: Solving systems of equations by elimination

Solve each system of equations using *elimination of a variable*. Check your solution.

9.
$$\begin{cases} 2x + y = 3 \\ 2x + 2y = 2 \end{cases}$$

Answer:
(2, -1)

Check:

$$\begin{aligned} 2(2) - 1 &= 3 \\ 3 &= 3 \\ 2(2) + 2(-1) &= 2 \\ 2 &= 2 \end{aligned}$$

10.
$$\begin{cases} 2x + 5y = 3 \\ x + 5y = 6 \end{cases}$$

Answer:

Check:

11.
$$\begin{cases} 2x + 0.5y = 3 \\ x + 2y = 8.5 \end{cases}$$

Answer:
(0.5, 4)

Check:

$$\begin{aligned} 2(.5) + .5(4) &= 3 \\ 3 &= 3 \\ .5 + 2(4) &= 8.5 \\ 8.5 &= 8.5 \end{aligned}$$

12.
$$\begin{cases} 3x + 5y = -1 \\ x + 2y = -1 \end{cases}$$

Answer:

Check:

13.
$$\begin{cases} 3x + 5y = -3 \\ x + 2y = -\frac{4}{3} \end{cases}$$

Answer:

$$\left(\frac{2}{3}, -1\right)$$

Check:

$$3\left(\frac{2}{3}\right) + 5(-1) = -3$$

$$-3 = -3$$

$$\frac{2}{3} + 2(-1) = -\frac{4}{3}$$

$$-\frac{4}{3} = -\frac{4}{3}$$

14. A 150-yard pipe is cut to provide drainage for two fields. If the length of one piece (a) is three yards less than twice the length of the second piece (b), what are the lengths of the two pieces?

Answer:

~~_____~~
~~_____~~
~~_____~~

Check:

~~_____~~
~~_____~~
~~_____~~

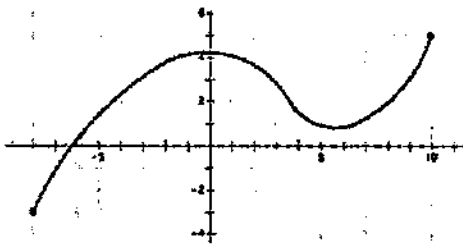
GO

Topic: Identifying functions

For each graph determine if the relationship represents a function. If it is a function, write yes. If it is not a function, explain why it is not.

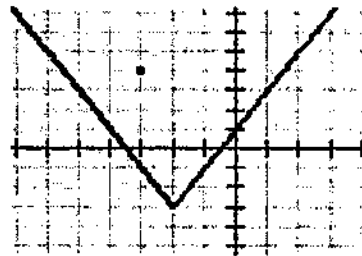
Explanations may vary.

15.



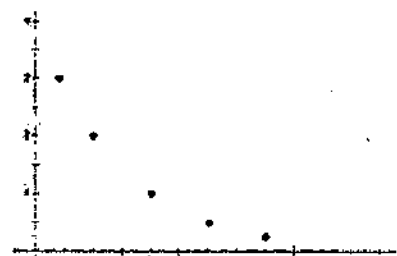
Answer: Yes, for every x there is only 1 y .

16.



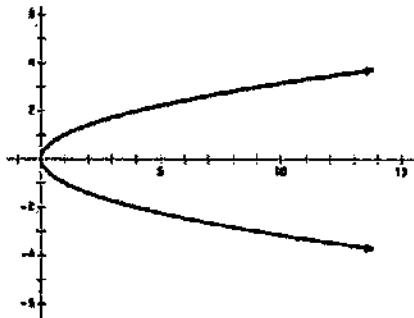
Answer: ~~_____~~
~~_____~~

17.



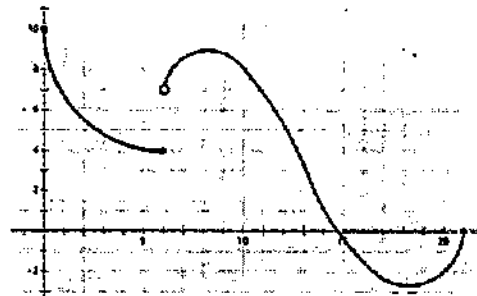
Answer: Yes, for every input has only one output.

18.



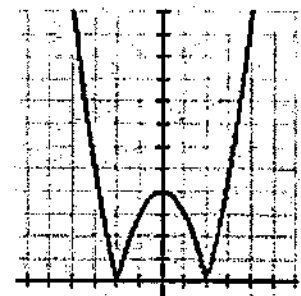
Answer: ~~_____~~
~~_____~~

19.



Answer: Yes, at $x = 6, y = 4$ and then the second piece of the function begins.

20.



Answer: ~~_____~~
~~_____~~

READY, SET, GO!

Name _____


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READY

Topic: System of inequalities





For each of the systems of inequalities, determine if the given coordinates are solutions to the system. (Show your work.)

1. $\begin{cases} y \leq 3x - 5 \\ y \geq x + 2 \end{cases}$ a. (6, 10) b. (1, 4) c. (8, 15)	2. $\begin{cases} y > -2x + 9 \\ y \geq 5x - 6 \end{cases}$ 	3. $\begin{cases} y < -\frac{1}{2}x + 9 \\ y > 6x - 10 \end{cases}$ a. (-2, -5) b. (7, 3) c. (-8, 10)
---	--	--

SET

Topic: Determining the number of solutions in a system of equations

Write each equation in slope-intercept form. Based on slope-intercept form of the equations determine whether the system of equations has zero, one, or infinitely many solutions. How do you know?

4. $3x - 4y = 13$ $y = -3x - 7$ $y = \frac{3}{4}x - \frac{13}{4}$ $y = -3x - 7$ How many solutions? Answer:  How do you know? Answer: 	5. $3x - 3y = 3$ $x - y = 1$ $y = x - 1$ $y = x - 1$ How many solutions? Answer: Infinitely Many How do you know? Answer: They are the same equation.	6. $0.5x - y = 30$ $0.5x - y = -30$ $y = 0.5x - 30$ $y = 0.5x + 30$ How many solutions? Answer:  How do you know? Answer: 	7. $4x - 2y = -2$ $3x + 2y = -12$ $y = 2x + 1$ $y = \frac{-3}{2}x - 6$ How many solutions? Answer: 1 How do you know? Answer: They have different slopes.
---	--	--	--

Solve each system. Write your solution as an ordered pair or indicate if it has no solutions or infinitely many solutions.

8. $\begin{cases} x + 4y = 6 \\ x + y = 3 \end{cases}$

Answer: 

9. $\begin{cases} 2x + y = 5 \\ y = x - 4 \end{cases}$

Answer: (3, -1)

10. $\begin{cases} y = 2x + 1 \\ 2x - y + 1 = 0 \end{cases}$

Answer: 

11.
$$\begin{cases} 4y - 5x = 9 \\ x - 4y = 11 \end{cases}$$

Answer: (-5,-4)

12.
$$\begin{cases} y = x - 1 \\ -x + y = 4 \end{cases}$$

Answer: [REDACTED]

13.
$$\begin{cases} -2x + 5y = -1 \\ 3x + 2y = 11 \end{cases}$$

Answer: (3,1)

14.
$$\begin{cases} -3x + 4y = 12 \\ 2x + y = -8 \end{cases}$$

Answer: [REDACTED]

15.
$$\begin{cases} 9x - 3y = 3 \\ 3x + 8y = -17 \end{cases}$$

Answer: $(-\frac{1}{3}, -2)$

16.
$$\begin{cases} -7x + y = -2 \\ 7x - y - 2 = 0 \end{cases}$$

Answer: [REDACTED]

17.
$$\begin{cases} 2y = x + 2 \\ -\frac{1}{2}x + y = 1 \end{cases}$$

Answer: Infinitely many

18.
$$\begin{cases} 2y = 2x - 2 \\ -\frac{1}{2}x + \frac{1}{2}y = 1 \end{cases}$$

Answer: [REDACTED]

19.
$$\begin{cases} -2y = 4x + 2 \\ 8x - 4y = -4 \end{cases}$$

Answer: $(-\frac{1}{2}, 0)$

20.
$$\begin{cases} x + y = 2x + 5 \\ x + y = 6y - 9 \end{cases}$$

Answer: [REDACTED]

21.
$$\begin{cases} 5x = -y \\ 5x + 2y = 30 \end{cases}$$

Answer: (-6,30)

22.
$$\begin{cases} 3x + 8y = 9y - 6 \\ 9x - 3y = 3 \end{cases}$$

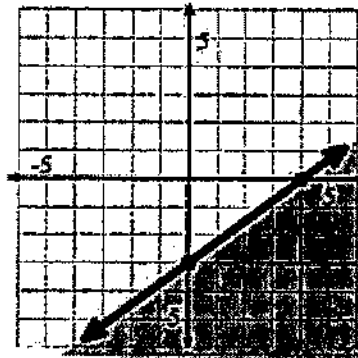
Answer: [REDACTED]

GO

Topic: graphing two variable inequalities

Graph the following inequalities. Justify the region you shade by showing at least one point in the region as being a solution to each inequality.

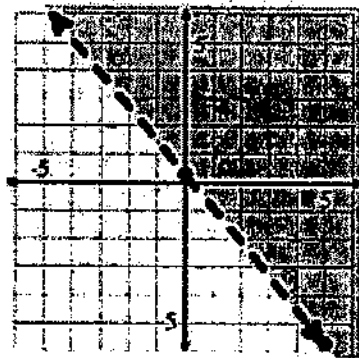
23. $3x - 4y \geq 12$



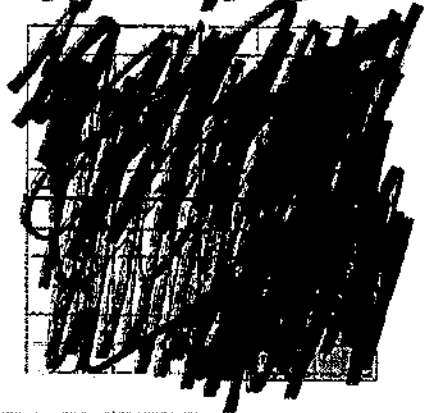
24. $x + 6y < 6$



25. $6x + 5y > 1$



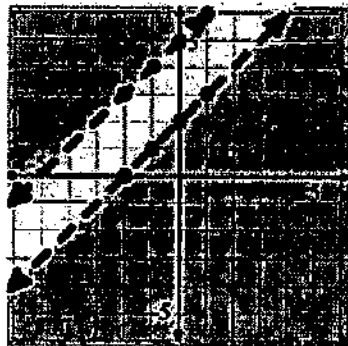
26. $x - \frac{1}{2}y \geq 3$



27. On the same set of axes graph
 $y < x + 2$ and $y > x + 5$.

Do the solution sets of these two
inequalities share any points?
Explain.

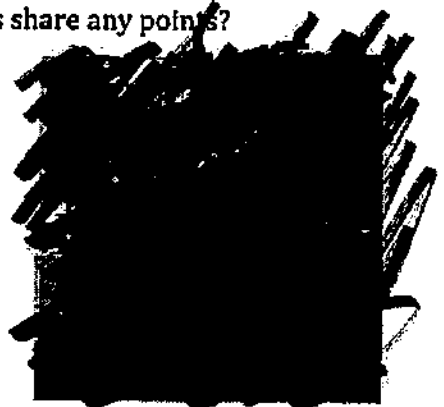
Answer:
No, they
will never
cross and
they are
shaded
away from
each other.



28. On the same set of axes graph
 $y < x + 2$ and $y < x + 5$.

Do the solution sets of these two
inequalities share any points?
Explain.

Answer:



READY, SET, GO!

Name _____

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READY

Topic: Solving Systems by Substitution and Elimination

Solve each system of equations using an algebraic method.

1.
$$\begin{cases} 3x - y = 1 \\ 3x + 2y = 16 \end{cases}$$

Answer:

(2, 5)

2.
$$\begin{cases} x + 2y = 5 \\ 3x + 5y = 14 \end{cases}$$

Answer:

~~_____~~

3.
$$\begin{cases} 4x + 2y = -8 \\ x - 2y = -7 \end{cases}$$

Answer:

(-3, 2)

4.
$$\begin{cases} 2x + 3y = 2 \\ 3x - 4y = -14 \end{cases}$$

Answer:

~~_____~~

5.
$$\begin{cases} x + 2y = 11 \\ x - 4y = 2 \end{cases}$$

Answer:

$(8, \frac{3}{2})$

6.
$$\begin{cases} 2x + y = 0 \\ 5x + 3y = 1 \end{cases}$$

Answer:

~~_____~~

SET

Topic: Row reduction in matrices.

7. Create a matrix to match each step in the solving of the system of equations given. Also, write a description of what happened to the equation and the matrix between steps.

	<u>System of Equations</u>	<u>Description</u>	<u>Matrix</u>
<i>Given System</i>	$\begin{cases} 3x + 2y = 40 \\ x - 7y = -2 \end{cases}$		$\left[\begin{array}{cc c} 3 & 2 & 40 \\ 1 & -7 & -2 \end{array} \right]$
	↓	$-3R_2 \rightarrow R_2$	↓
<i>Step 1</i>	$\begin{cases} 3x + 2y = 40 \\ -3x + 21y = 6 \end{cases}$	↓ Answer:	$\left[\begin{array}{cc c} 3 & 2 & 40 \\ -3 & 21 & 6 \end{array} \right]$ Answer: $\begin{bmatrix} 3 & 21 \\ 3 & 21 \end{bmatrix}$
	↓	$R_1 + R_2 \rightarrow R_2$	↓
<i>Step 2</i>	$\begin{cases} 3x + 2y = 40 \\ 0x + 23y = 46 \end{cases}$	↓ Answer:	$\left[\begin{array}{cc c} 3 & 2 & 40 \\ 0 & 23 & 46 \end{array} \right]$ Answer: $\begin{bmatrix} 3 & 2 & 40 \\ 0 & 23 & 46 \end{bmatrix}$
	↓	$\frac{1}{23}R_2 \rightarrow R_2$	↓
<i>Step 3</i>	$\begin{cases} 3x + 2y = 40 \\ 0x + y = 2 \end{cases}$	↓ Answer:	$\left[\begin{array}{cc c} 3 & 2 & 40 \\ 0 & 1 & 2 \end{array} \right]$ Answer: $\begin{bmatrix} 3 & 2 & 40 \\ 0 & 1 & 2 \end{bmatrix}$
	↓	$R_1 - 2R_2 \rightarrow R_1$	↓
<i>Step 4</i>	$\begin{cases} 3x + 0y = 36 \\ 0x + y = 2 \end{cases}$	↓ Answer:	$\left[\begin{array}{cc c} 3 & 0 & 36 \\ 0 & 1 & 2 \end{array} \right]$ Answer: $\begin{bmatrix} 3 & 0 & 36 \\ 0 & 1 & 2 \end{bmatrix}$
	↓	$\frac{1}{3}R_1 \rightarrow R_1$	↓
<i>Step 5</i>	$\begin{cases} x + 0y = 12 \\ 0x + y = 2 \end{cases}$	↓ Answer:	$\left[\begin{array}{cc c} 1 & 0 & 12 \\ 0 & 1 & 2 \end{array} \right]$ Answer: $\begin{bmatrix} 1 & 0 & 12 \\ 0 & 1 & 2 \end{bmatrix}$

SECONDARY MATH I // MODULE 5
SYSTEMS - 5.11H

5.11H

GO

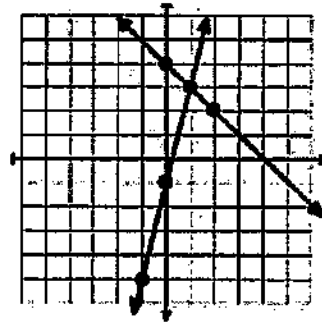
Topic: Solving Systems of Equations by Graphing

Solve each system of equations by graphing.

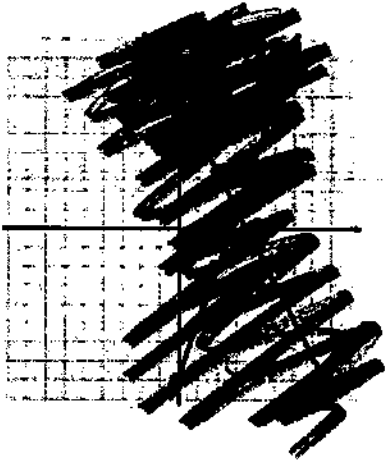
8.
$$\begin{cases} y = 3x - 3 \\ y = -3x + 3 \end{cases}$$



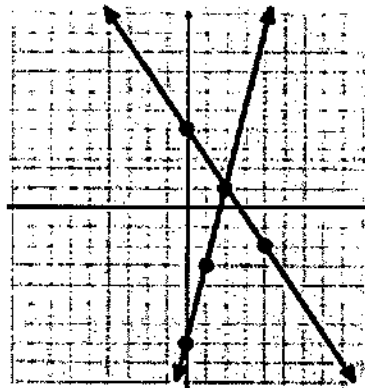
9.
$$\begin{cases} y = 4x - 1 \\ y = -x + 4 \end{cases} \quad (1, 3)$$



10.
$$\begin{cases} y = -2x + 7 \\ -3x + y = -8 \end{cases}$$



11.
$$\begin{cases} 4x - y = 7 \\ 3x + 2y = 8 \end{cases} \quad (2, 1)$$



READY, SET, GO!

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READY

Topic: Creating matrices for real life situations.

1. In an earlier assignment you worked the following problem:
"A theater wants to take in \$2000 for a certain matinee. Children's tickets cost \$5 each and adult tickets cost \$10 each. If the theater has a maximum of 350 seats, write a system of equations that can be solved to determine the number of both children and adult tickets the theater can sell."

Set up a matrix that goes with the situation described above.

$$\text{Answer: } \begin{bmatrix} 5 & 10 & 2000 \\ 1 & 1 & 350 \end{bmatrix}$$

SET

Topic: Row reduction in matrices.

Assume that the matrices below represent linear systems of equations. Practice the strategy you used for reducing a given matrix so that the left portion of the matrix (the 2 rows and first 2 columns of entries) has ones on the diagonal. Write a description of what you did to get from one matrix to another in each step of your sequence of matrices. Answers:

~~2. $\begin{bmatrix} 6 & 2 & -6 \\ 2 & 1 & 1 \end{bmatrix} \xrightarrow{3R_1 \rightarrow R_2} \begin{bmatrix} 6 & 2 & -6 \\ 18 & 6 & -18 \end{bmatrix} \xrightarrow{R_2 \div 3} \begin{bmatrix} 6 & 2 & -6 \\ 6 & 2 & -6 \end{bmatrix} \xrightarrow{R_2 - R_1} \begin{bmatrix} 6 & 2 & -6 \\ 0 & 0 & 0 \end{bmatrix}$~~

3. $\begin{bmatrix} -3 & 1 & -12 \\ 2 & 3 & -14 \end{bmatrix} \xrightarrow{3R_1 - R_2 \rightarrow R_2} \begin{bmatrix} -3 & 1 & -12 \\ -11 & 0 & -22 \end{bmatrix} \xrightarrow{-\frac{1}{11}R_2 \rightarrow R_2} \begin{bmatrix} -3 & 1 & -12 \\ 1 & 0 & 2 \end{bmatrix} \xrightarrow{R_1 + 3R_2 \rightarrow R_1} \begin{bmatrix} 0 & 1 & -6 \\ 1 & 0 & 2 \end{bmatrix} \xrightarrow{\text{switch } R_1 \text{ and } R_2} \begin{bmatrix} 1 & 0 & 2 \\ 0 & 1 & -6 \end{bmatrix}$ Answer: (2, -6)

4. ~~$\begin{bmatrix} 9 & 2 & 1 \\ 2 & 1 & 1 \end{bmatrix} \xrightarrow{9R_2 \rightarrow R_1} \begin{bmatrix} 18 & 4 & 2 \\ 2 & 1 & 1 \end{bmatrix} \xrightarrow{R_1 \div 2} \begin{bmatrix} 9 & 2 & 1 \\ 2 & 1 & 1 \end{bmatrix} \xrightarrow{R_1 - 9R_2} \begin{bmatrix} 0 & -7 & -8 \\ 2 & 1 & 1 \end{bmatrix} \xrightarrow{R_1 \leftrightarrow R_2} \begin{bmatrix} 2 & 1 & 1 \\ 0 & -7 & -8 \end{bmatrix} \xrightarrow{R_1 \div 2} \begin{bmatrix} 1 & \frac{1}{2} & \frac{1}{2} \\ 0 & -7 & -8 \end{bmatrix} \xrightarrow{R_1 - \frac{1}{2}R_2} \begin{bmatrix} 1 & 0 & \frac{5}{2} \\ 0 & -7 & -8 \end{bmatrix} \xrightarrow{R_2 \div -7} \begin{bmatrix} 1 & 0 & \frac{5}{2} \\ 0 & 1 & \frac{8}{7} \end{bmatrix} \xrightarrow{R_1 - \frac{5}{2}R_2} \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & \frac{8}{7} \end{bmatrix}$~~

Answer: ~~(1, 4)~~

5. $\begin{bmatrix} 5 & 1 & 9 \\ 10 & -7 & -18 \end{bmatrix} \xrightarrow{2R_1 - R_2 \rightarrow R_2} \begin{bmatrix} 5 & 1 & 9 \\ 0 & 9 & 36 \end{bmatrix} \xrightarrow{R_2 \div 9} \begin{bmatrix} 5 & 1 & 9 \\ 0 & 1 & 4 \end{bmatrix} \xrightarrow{R_1 - R_2 \rightarrow R_1} \begin{bmatrix} 5 & 0 & 5 \\ 0 & 1 & 4 \end{bmatrix} \xrightarrow{R_1 \div 5} \begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & 4 \end{bmatrix}$ Answer: (1, 4)

GO

Topic: Solving Systems of Equations by Graphing

Solve each system of equations using a method of your choice.

6.
$$\begin{cases} x - y = 11 \\ 2x + y = 19 \end{cases}$$

Answer: 

7.
$$\begin{cases} 8x + y = -16 \\ -3x + y = -5 \end{cases}$$

Answer: $(-1, -8)$

8.
$$\begin{cases} -4x + 9y = 9 \\ x - 3y = -6 \end{cases}$$

Answer: 

9.
$$\begin{cases} -7x + y = -19 \\ -2x + 3y = -19 \end{cases}$$

Answer: $(2, -5)$