

Daily Do from last class

Graph  $3x + 8 > y$



Determine which ordered pairs are part of the solution set for each inequality.

- $y > 3x$ ,  $\{(1, 5), (1, 0), (-1, 0), (5, 1)\}$   **$\{(1, 5), (-1, 0)\}$**
- $y \geq x + 3$ ,  $\{(2, -3), (-2, -1), (1, 6), (3, 4)\}$   **$\{(1, 6)\}$**
- $y < x - 1$ ,  $\{(3, 1), (-2, -4), (4, -2), (-3, 3)\}$   **$\{(3, 1), (-2, -4), (4, -2)\}$**

Match each inequality with its graph.

- $y - 2x < 2$  **b**
- $y \leq -3x$  **d**
- $2y - x \geq 4$  **a**
- $x + y > 1$  **c**

Graph each inequality.

- $y < -1$
- $y \geq x - 5$
- $y > 3x$
- $y \leq 2x + 4$
- $y + x > 3$
- $y - x \geq 1$

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Your Name

Mrs. T

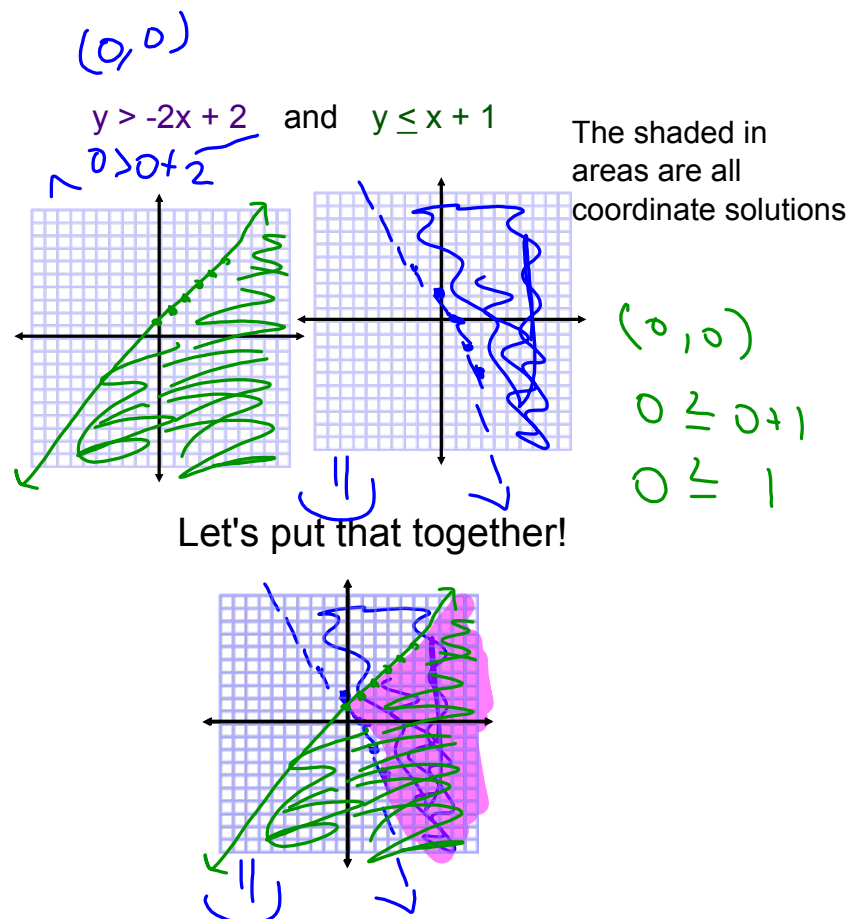
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Notes

# 6-8 Graphing Systems of Inequalities In Two Variables

Objective: To be able to graph two inequalities in two variables on a coordinate plane and determine the solutions by shading. To be able to test a point in both equations to determine which region is a solution.

Virtue/Skill: These help to determine feasible solutions for companies' profit and cost margins.



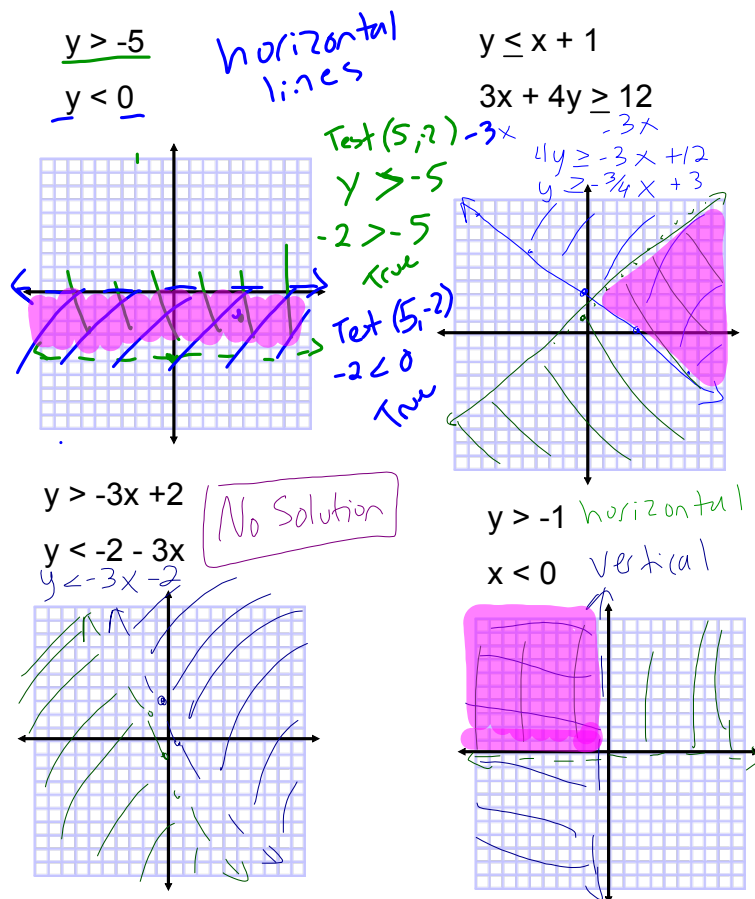
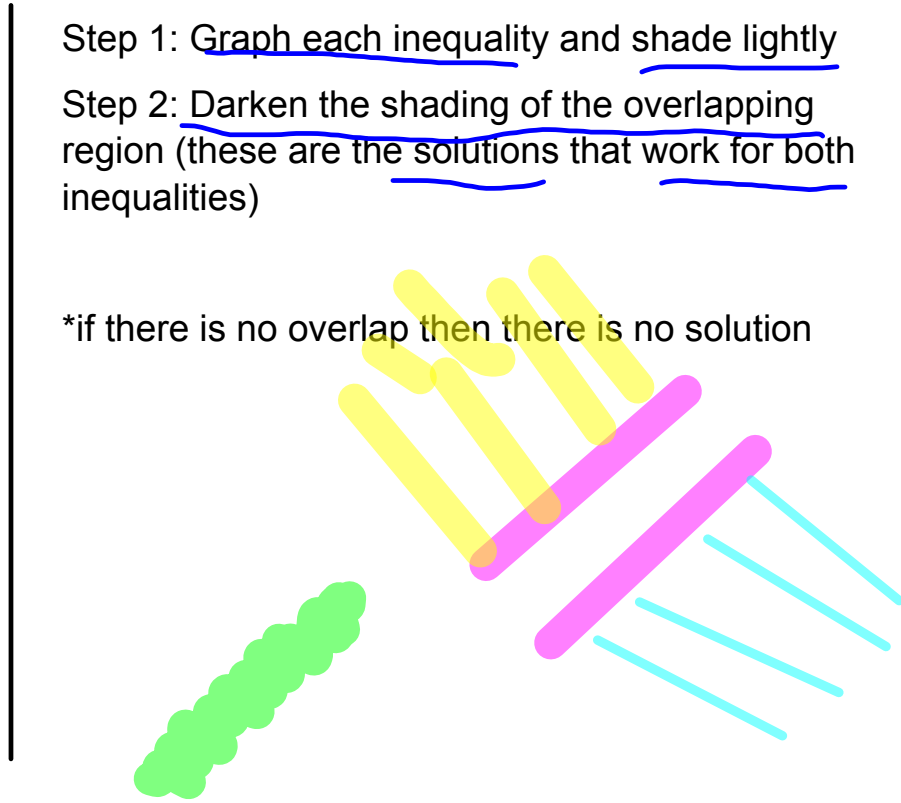
# Let's put that together!

Graphing Systems of Inequalities

Step 1: Graph each inequality and shade lightly

Step 2: Darken the shading of the overlapping region (these are the solutions that work for both inequalities)

\*if there is no overlap then there is no solution



(11.)

$$y > 1x + 0 ; y > -1x + 0$$

dashed so  $>$  or  $<$ 

(1, 2)

was a  
solution for  
both

Test (1, 2)

$$2 \quad 1(1) + 0$$

$$2 > 1$$

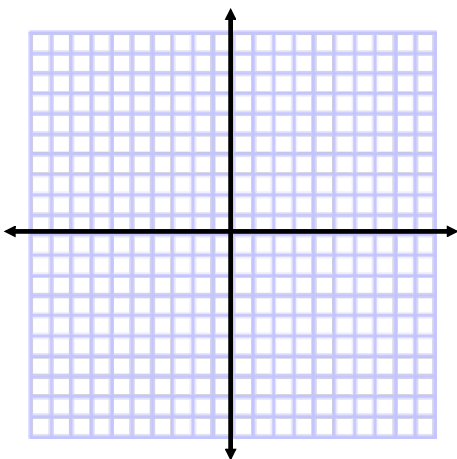
Test (1, 2)

$$2 \quad -1(1) + 0$$

$$2 > -1$$

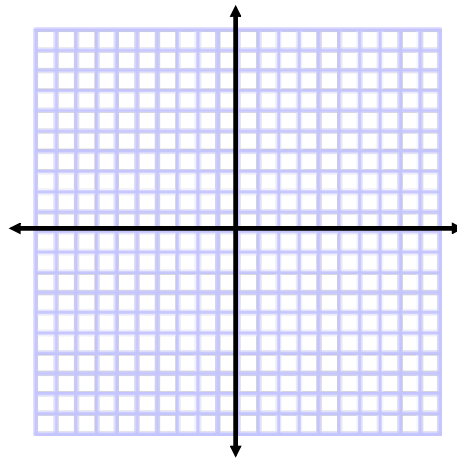
$$y > -3x + 2$$

$$y < -2 - 3x$$



$$y \leq 2x + 3$$

$$y > -1 + 2x$$



# Summary

Objective: To be able to graph two inequalities in two variables on a coordinate plane and determine the solutions by shading. To be able to test a point in both equations to determine which region is a solution.

Virtue/Skill: These help to determine feasible solutions for companies' profit and cost margins.

Assignment: Workbook 6-8

## Exit Question

Graph  $5x - 2y \leq 6$

$y > -x + 1$

**6-8 Skills Practice**  
**Graphing Systems of Inequalities**

Solve each system of inequalities by graphing.

1.  $x > -1$   
 $y \leq -3$

2.  $y > 2$   
 $x < -2$

3.  $y > x + 3$   
 $y \leq -1$

4.  $x < 2$   
 $y - x \leq 2$

5.  $x + y \leq -1$   
 $x + y \geq 3$

6.  $y - x > 4$   
 $x + y > 2$

7.  $y > x + 1$   
 $y \geq -x + 1$

8.  $y \geq -x + 2$   
 $y < 2x - 2$

9.  $y < 2x + 4$   
 $y \geq x + 1$

Write a system of inequalities for each graph.

10.  $y \leq x + 2, y \geq x - 3$

11.  $y > -x, y > x$

12.  $y \geq x + 1, y < 1$

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Members of the swim team want to wash their hair. The bathroom has less than 5600 liters of water and at most 2.5 liters of shampoo.

$70L + 60S < \underline{5600}$  represents the number of long-haired members  $L$  and short-haired members  $S$  who can wash their hair with less than 5600 liters of water.

$0.02L + 0.01S \leq 2.5$  represents the number of long-haired members and short-haired members who can wash their hair with at most 2.5 liters of shampoo.

Does the bathroom have enough water and shampoo for 8 long-haired members and 7 short-haired members?

Yes, the bathroom has enough water & shampoo for 8 long-haired people & 7 short-haired people bc  $980 < 5600$  liters of water and  $0.23 \leq 2.5$  liters of shampoo

Nadia built a robot to filter air and water efficiently. She expects the robot to filter more than 343 liters of air and water while using less than 49 Joules of energy.

$12A + 8W > 343$  represents the number of minutes the robot filters air  $A$  and water  $W$  to filter more than 343 liters of air and water.

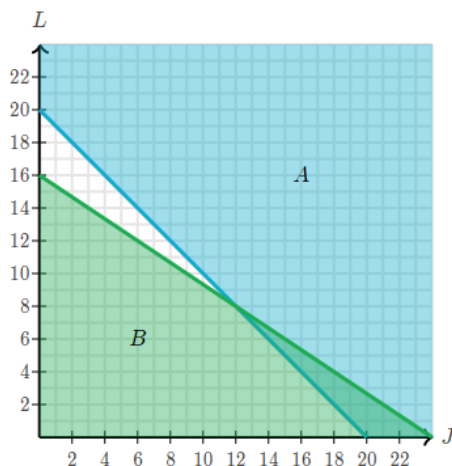
$3A + 4W < 49$  represents the number of minutes the robot filters air and water while using less than 49 Joules of energy.

Does the robot meet both of Nadia's expectations by filtering air for 20 minutes and filtering water for 15 minutes?

No uses too much power

Wladyslaw wants to water jasmine plants and lily plants in his garden. His goal is to water at least 20 plants (condition  $A$ ) with 12 liters of water at most (condition  $B$ ).

The graph represents the constraints on the number of jasmine  $J$  and lily  $L$  plants Wladyslaw waters.



What is the least number of jasmine plants Wladyslaw must water to meet both his constraints?

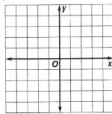
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### 6-8 Practice

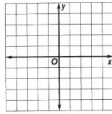
#### Graphing Systems of Inequalities

Solve each system of inequalities by graphing.

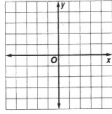
1.  $y > x - 2$   
 $y \leq x$



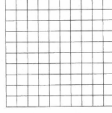
2.  $y \geq x + 2$   
 $y > 2x + 3$



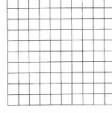
3.  $x + y \geq 1$   
 $x + 2y > 1$




4.  $y < 2x - 1$   
 $y > 2 - x$



5.  $y > x - 4$   
 $2x + y \leq 2$



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

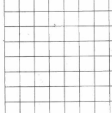


**FITNESS** For Exercises 7 and 8, use the following information.

Diego started an exercise program in which each week he works out at the gym between 4.5 and 6 hours and walks between 9 and 12 miles.

7. Make a graph to show the number of hours Diego works out at the gym and the number of miles he walks per week.

8. List three possible combinations of working out and walking that meet Diego's goals.

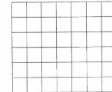


**SOUVENIRS** For Exercises 9 and 10, use the following information.

Emily wants to buy turquoise stones on her trip to New Mexico to give to at least 4 of her friends. The gift shop sells stones for either \$4 or \$6 per stone. Emily has no more than \$30 to spend.

9. Make a graph showing the numbers of each price of stone Emily can purchase.

10. List three possible solutions.



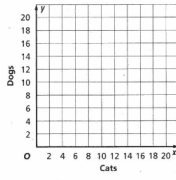
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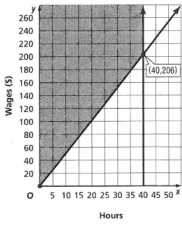
### 6-8 Word Problem Practice

#### Graphing Systems of Inequalities

1. **PETS** Renée's Pet Store never has more than a combined total of 20 cats and dogs and never more than 8 cats. This is represented by the inequalities  $x \leq 8$  and  $x + y \leq 20$ . Solve the system of inequalities by graphing.



2. **WAGES** The minimum wage for one group of workers in Texas is \$5.15 per hour. The graph below shows the possible weekly wages for a person who makes at least minimum wages and works at most 40 hours. Write the system of inequalities for the graph.



3. **FUND-RAISING** The Camp Courage Club plans to sell tins of popcorn and peanuts as a fundraiser. The Club members have \$900 to spend on products to sell and want to order up to 200 tins in all. They also want to order at least as many tins of popcorn as tins of peanuts. Each tin of popcorn costs \$3 and each tin of peanuts costs \$4. Write a system of equations to represent the conditions of this problem.

**BUSINESS** For Exercises 4-6, use the following information.

For maximum efficiency, a factory must have at least 100 workers, but no more than 200 workers on a shift. The factory also must manufacture at least 30 units per worker.

4. Let  $x$  be the number of workers and let  $y$  be the number of units. Write four inequalities expressing the conditions in the problem given above.

5. Graph the systems of inequalities.

6. List at least three possible solutions.

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Antonius the chef wants to cook several batches of lasagna and spaghetti for his restaurant. He plans to use at least 4.5 kilograms of pasta and more than 6.3 liters of sauce to cook spaghetti and lasagna.

$0.3S + 0.65L \geq 4.5$  represents the number of batches of spaghetti  $S$  and lasagna  $L$  Antonius can cook to use at least 4.5 kilograms of pasta.

$0.25S + 0.8L > 6.3$  represents the number of batches of spaghetti and lasagna Antonius can cook to use more than 6.3 liters of sauce.

Does Antonius meet both of his expectations by cooking 10 batches of spaghetti and 4 batches of lasagna?

### 6-8 Practice and Word Problems

**6-8 Practice**  
**Graphing Systems of Inequalities**

Solve each system of inequalities by graphing.

1.  $y > x - 2$   
 $y = x$

2.  $y = x + 2$   
 $y > 2x + 3$

3.  $x + y \geq 1$   
 $x + 2y > 1$

4.  $y < 2x - 1$   
 $y > 2 - x$

5.  $y > x - 4$   
 $2x + y = 2$

6.  $2x - y \geq 2$   
 $x - 2y = 2$

**FITNESS** For Exercises 7 and 8, use the following information.  
Diego started an exercise program in which each week he works out at the gym between 4.5 and 6 hours and walks between 9 and 12 miles.

7. Make a graph to show the number of hours Diego works out at the gym and the number of miles he walks per week.

8. List three possible combinations of working out and walking that meet Diego's goals. **Sample answers:** gym 5 h, walk 9 mi; gym 6 h, walk 10 mi, gym 5.5 h, walk 11 mi

**SOUVENIRS** For Exercises 9 and 10, use the following information.  
Emily wants to buy turquoise stones on her trip to New Mexico to give to at least 4 of her friends. The gift shop sells stones for either \$4 or \$6 per stone. Emily has no more than \$30 to spend.

9. Make a graph showing the numbers of each price of stone Emily can purchase.

10. List three possible solutions. **Sample answer:** one \$4 stone and four \$6 stones; three \$4 stones and three \$6 stones; five \$4 stones and one \$6 stone

**6-8 Word Problem Practice**  
**Graphing Systems of Inequalities**

1. **PETS** René's Pet Store never has more than a combined total of 20 cats and dogs and never more than 8 cats. This is represented by the inequalities  $x = 8$  and  $x + y \leq 20$ . Solve the system of inequalities by graphing.

2. **WAGES** The minimum wage for one group of workers in Texas is \$5.15 per hour. The graph below shows the possible weekly wages for a person who makes at least minimum wages and works at most 40 hours. Write the system of inequalities for the graph.

3. **FUND-RAISING** The Camp Courage Club plans to sell tins of popcorn and peanuts as a fundraiser. The Club members have \$900 to spend on products to sell and want to order up to 200 tins in all. They also want to order at least as many tins of popcorn as tins of peanuts. Each tin of popcorn costs \$5 and each tin of peanuts costs \$4. Write a system of equations to represent the conditions of this problem.  $x + y \leq 200$ ;  $x \geq y$ ;  $3x + 4y = 900$   
**Students may also include  $x \geq 0$  and  $y \geq 0$ .**

**BUSINESS** For Exercises 4-6, use the following information.  
For maximum efficiency, a factory must have at least 100 workers, but no more than 200 workers on a shift. The factory also must manufacture at least 30 units per worker.

4. Let  $x$  be the number of workers and let  $y$  be the number of units. Write four inequalities expressing the conditions in the problem given above.  $x \leq 200$ ;  $x \geq 100$ ;  $y \geq 3000$ ;  $y \geq 30x$

5. Graph the systems of inequalities.

6. List at least three possible solutions. (110, 3410), (150, 5100), (180, 6300)

*Handwritten notes:*

Chapter 6  
 $x$ : # of stones at \$4  
 $y$ : # of stones at \$6  
 money  $4x + 6y = 30$   
 Object  $x + y \geq 4$   
 $-x \quad -x$   
 $y \geq -x + 4$

$4x + 6y \geq 30$   
 $-4x$   
 $\frac{6y}{6} \leq \frac{-4x + 30}{6}$   
 $y \leq -\frac{2}{3}x + 5$