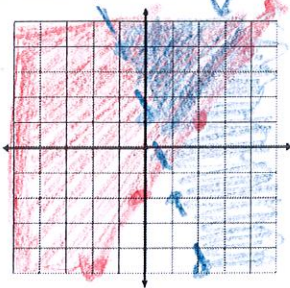


Algebra 1  
Solving Systems of Inequalities in Context

Name \_\_\_\_\_  
Date \_\_\_\_\_

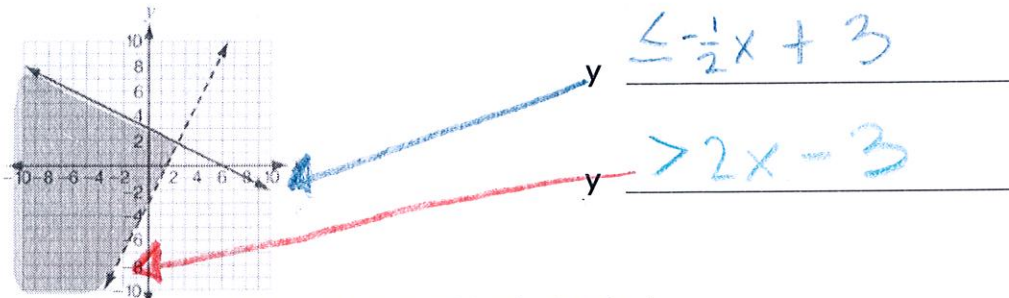
Graph the system and name three points that would be considered solutions.



$y > -3x + 1$   
 $3x - 2y \leq 4$   $y \geq \frac{3}{2}x - 2$

3 possible answers  $(0, 3)$   $(1, 2)$   $(2, 4)$  } answers vary  
Definitely NOT answers  $(-3, 0)$   $(0, -3)$   $(3, 0)$

Tiffany's solution to a system of inequalities is shown below.  
Can you write the two inequalities that she would have graphed to come with this answer?



$y \leq -\frac{1}{2}x + 3$   
 $y > 2x - 3$

Examples of Systems of Linear Inequalities in Context

Frosty wants to purchase Christmas gifts for all his new friends. He has found an online deal to buy ornaments (x) for \$8 each and stockings (y) for \$10 each. He only has \$100 to spend. Write an inequality to represent the number of items he could purchase.

$8x + 10y \leq 100$

While he would like to purchase gifts for ALL his new friends, there are 6 kids that are his favorites for which he feels he MUST give gifts. Write an inequality for how many of each item he MUST buy.

$x + y \geq 6$

Write this system of inequalities in graphing form:

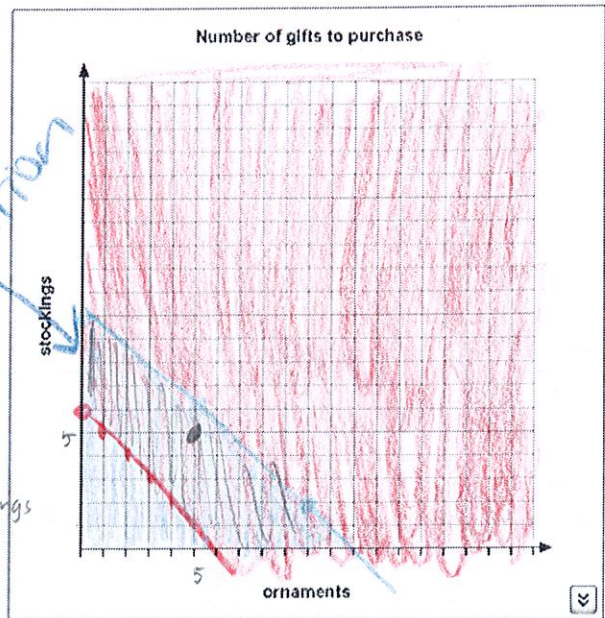
$y \leq -\frac{4}{3}x + 10$

$y \geq -x + 6$

Why should this system ONLY be graphed in the first quadrant? Graph it.

Not possible have negative amount of stockings or ornaments  
Would it be possible for Frosty to purchase 5 of each item? Justify your answer.

yes! The coordinate pt  $(5, 5)$  ornament stockings is in the overlapping shaded region/solution



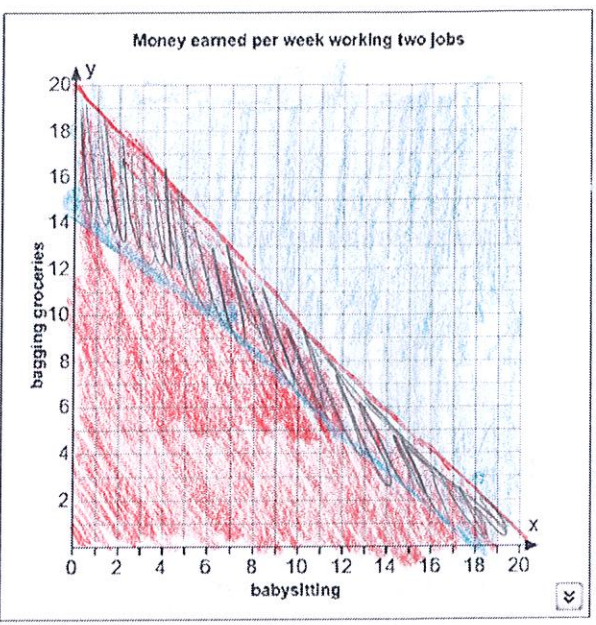
Suppose you have two jobs, babysitting, which pays \$5 per hour, and bagging groceries, which pays \$6 per hour. You can work no more than 20 hours each week, but you need to earn at least \$90 per week. How many hours can you work at each job?

Let  $x$  = the number of hours babysitting  
 Let  $y$  = the number of hours bagging groceries  
 Write a system of inequalities to represent the situation.

$$\begin{aligned} 5x + 6y &\geq 90 \\ x + y &\leq 20 \end{aligned}$$

Place each inequality in graphing form and graph.

$$\begin{aligned} y &\geq -\frac{5}{6}x + 15 \\ y &\leq -x + 20 \end{aligned}$$



How many hours can you work at each job?  
 (Give at least two possible solutions and explain.)

Answers any {  
 Ordered pair:  $(0, 16)$   
 Explanation: work 16 hrs bagging groceries only  
 Ordered pair:  $(6, 12)$   
 Explanation: work 6 hrs babysitting and 12 hrs bagging groceries

Jason is buying wings and hot dogs for a party. One package of wings costs \$7. Hot dogs cost \$4 per pound. He must spend less than \$40. Write an inequality to represent the cost of Jason's food for the party.

Let  $x$  = # of packages of wings and  $y$  = # of pounds of hot dogs

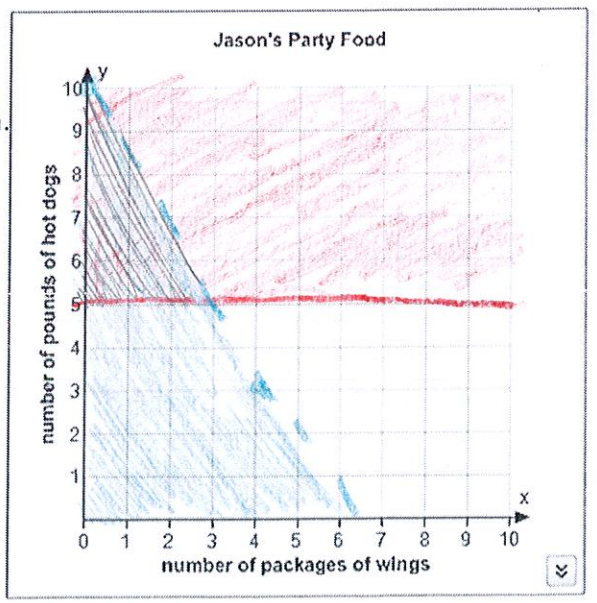
$$7x + 4y < 40$$

Jason knows that he will be buying at least 5 pounds of hot dogs. Write an inequality to represent this situation.

$$y \geq 5$$

Graph the system and give two possible solutions for Jason.

$$\begin{aligned} y &< -\frac{7}{4}x + 10 \\ y &\geq 5 \end{aligned}$$



Solutions:

Answers any {  
 Ordered pair:  $(1, 6)$   
 Explanation: 1 package of wings & 6 pounds of hot dogs  
 Ordered pair:  $(2, 5)$   
 Explanation: 2 packages of wings & 5 pounds of hot dogs