Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples

Linear Inequalities

A **linear inequality** is similar to a linear equation, however with an inequality symbol instead.

Example: Given **y ≥ -2x + 9**, determine which points satisfy the inequality:

a) (7, 4) **b)** (-1, 3) **c)** (10, -5)

Real World Example

John sells t-shirts. Plain shirts cost $5 and graphic shirts cost $7. In order to match his product costs, he must make at least $1,200.

a) Write an inequality to represent this situation.

b) If he sells 150 plain shirts and 60 graphic shirts, will he be able to cover the product costs?

c) If he sells 90 graphic shirts, what's the minimum number of plain shirts he must sell to break even?

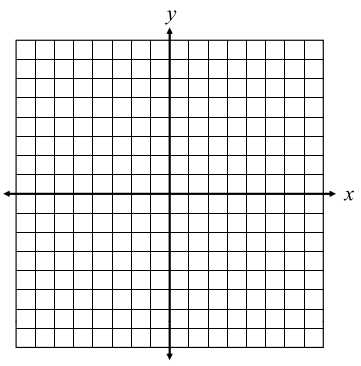
Graphing Linear Inequalities

Graphing linear inequalities in a visual way of showing the ordered pairs that satisfy the inequality.

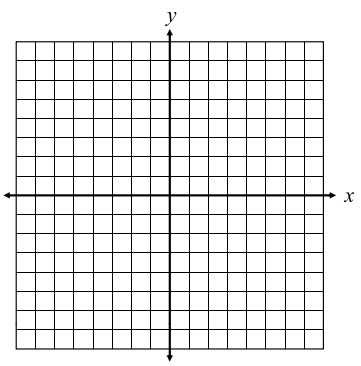
①	Put the inequality in **SLOPE-INTERCEPT FORM.** Be sure to flip the inequality if you multiply or divide by a negative.
②	**GRAPH** the line. Use a dashed line for < and > symbols and a solid line for ≤ and ≥ symbols.
③	**SHADE** above the line for > or ≥ symbols and below the line for < or ≤ symbols.

Directions: Graph each linear inequality.

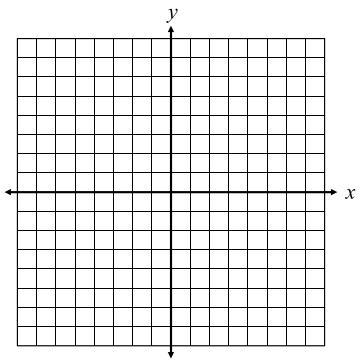
1. $y < \frac{2}{3}x - 1$



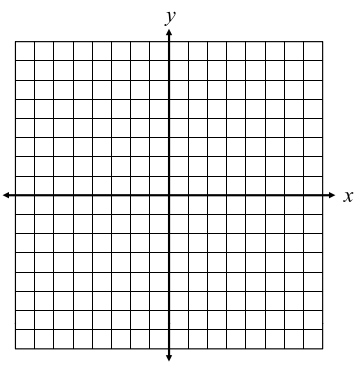
2. $y \geq -4x$



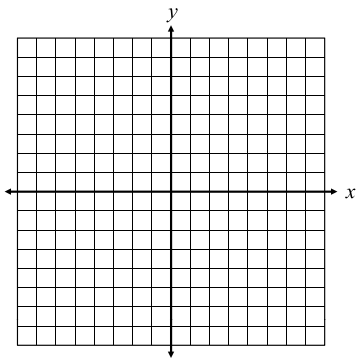
3. $5x + 3y \leq 12$



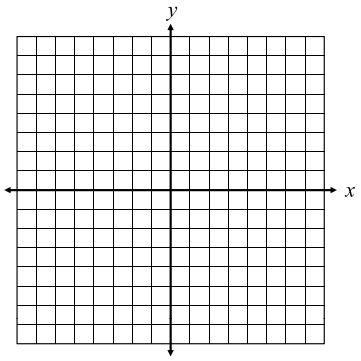
4. $x - 6y < -12$



5. $9x + 12y \geq -60$



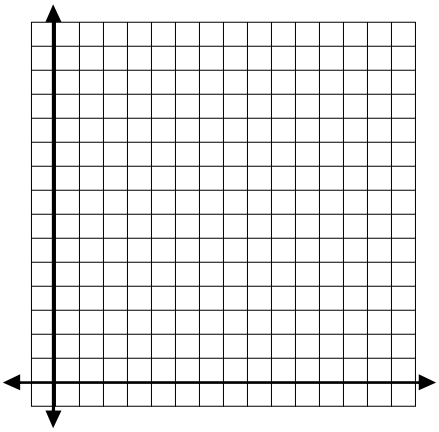
6. $x < -4$



7. Stephanie spends \$0.10 per text message sent and \$0.25 per picture message sent on her cell phone. Her monthly budget for messaging is \$30.

a) Write a linear inequality to represent this situation, then graph.

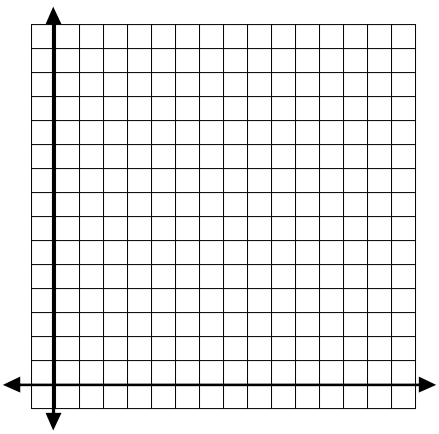
b) Using your graph, give two possible combinations of text and picture messages she can send and stay within her budget.



8. Scott makes \$12 per hour babysitting and \$8 per hour working at the grocery store. He will need to make at least \$600 to buy a new computer.

a) Write a linear inequality to represent this situation, then graph.

b) Using your graph, give two possible combinations of the number of hours Scott can babysit and work in the grocery store to ensure he can afford his new computer.



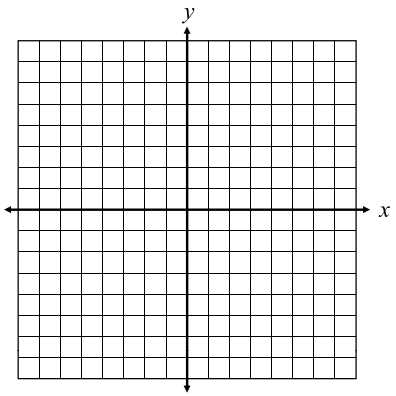
Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples	
Systems of Linear Inequalities	The **solution** to a system of linear inequalities is the **set of ordered pairs that satisfy ALL the linear inequalities**. The solution can be shown by graphing.	
	①	**GRAPH** and **SHADE** each linear inequality.
	②	The **SOLUTION** to the system is where the **shading overlaps**.

Directions: Graph each system of linear inequalities. Clearly indicate the solution region.

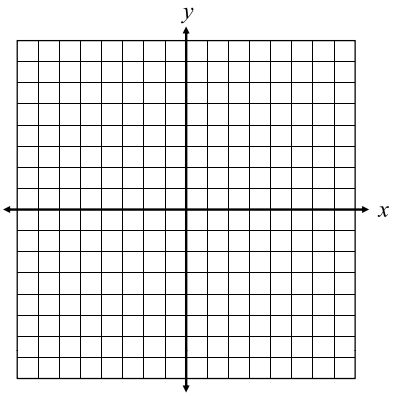
1. $y \le -\frac{2}{3}x - 1$

$y \ge \frac{1}{2}x - 8$



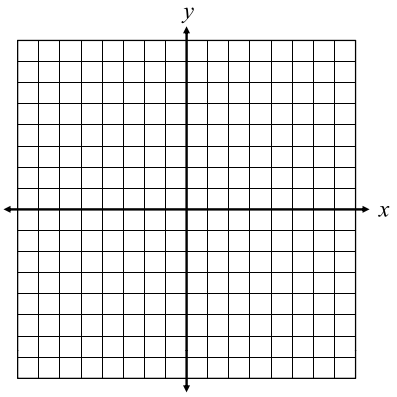
2. $y \le \frac{3}{4}x - 4$

$y > -7$



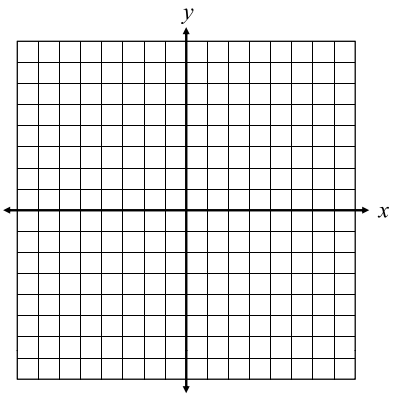
3. $x - y > 1$

$x + 4y > 20$



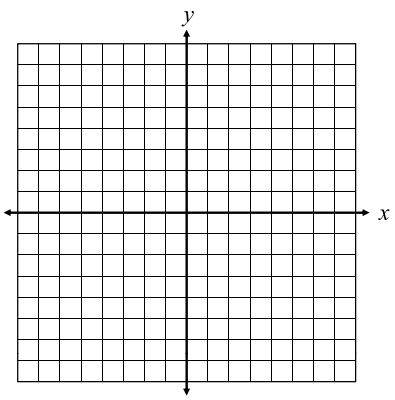
4. $7x + 3y \le 18$

$2x - 3y \le 9$



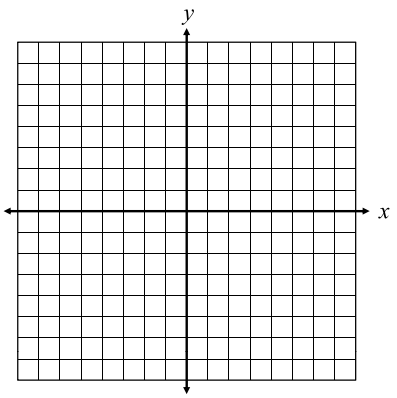
5. $x + 2y < -6$

$-4x - 2y < -10$



6. $4x - 5y > -5$

$x < -1$



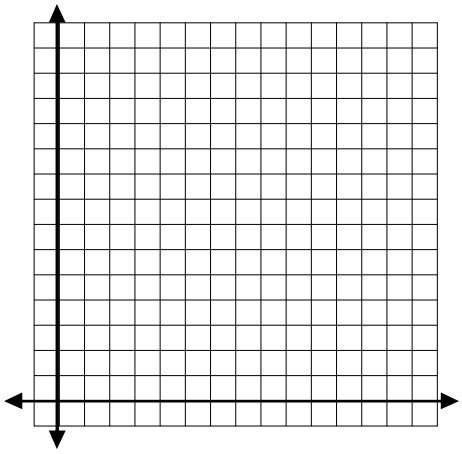
7. Which points are solutions to the system of inequalities below? Check all that apply.

$x - 6y > -48$
$2x + 3y < 9$

☐ (1, 1)	☐ (-2, 6)
☐ (9, -2)	☐ (-8, -3)
☐ (3, 4)	☐ (4, -7)

8. To raise money to attend Boy Scout camp, Alec is selling popcorn. Small bags of popcorn sell for $4 each and large bags sell for $6 each. He needs to earn at least $300 to attend camp. He will also earn a badge if he sells at least 60 bags total of any combination.

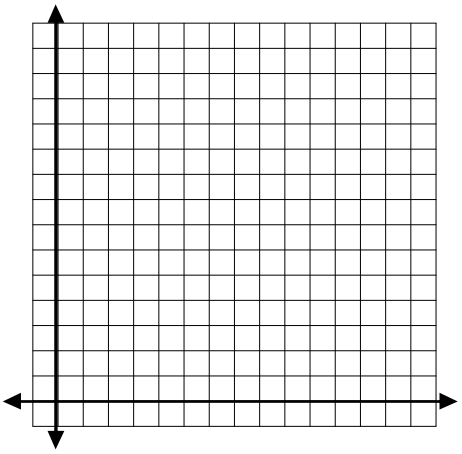
a) Write a system of linear inequalities to represent this situation, then graph.



b) Using your graph, give two possible combinations of bags of popcorn that Alec can sell to attend camp and earn his badge.

9. Greg needs at least $1.60 in stamps to mail a package. He has 28¢ and 4¢ stamps. He can use no more than twenty 4¢ stamps as he only has one book left.

a) Write a system of linear inequalities to represent this situation, then graph.



b) Using your graph, give two possible combinations of stamps that Greg can use to ensure he mails his package with the corect postage.

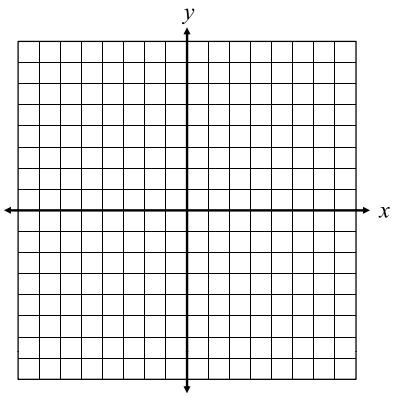
Name: _____ **Unit 2:** Linear Functions

Date: _____ **Bell:** _____ **Homework 7:** Linear Inequalities

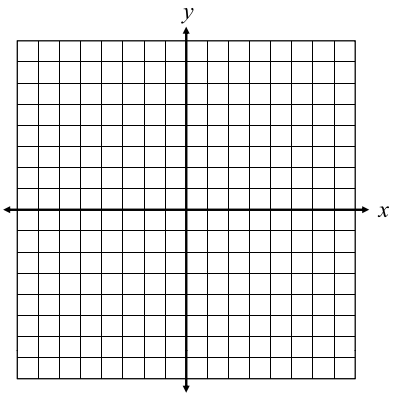
**** This is a 2-page document! ****

Directions: Graph each linear inequality.

1. $y \leq -\frac{5}{4}x + 2$



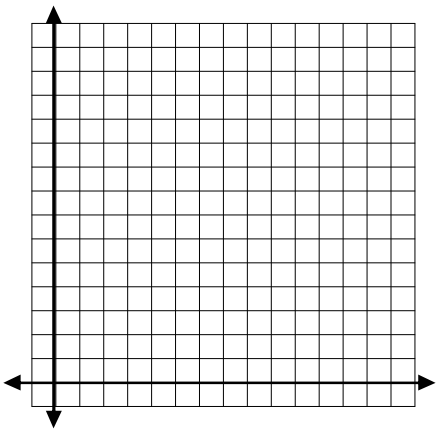
2. $4x - y < -1$



3. In football, a kicker can score one point for the extra point on a touchdown or three points for a field goal. Logan is a kicker for his high school football team. The record number of points scored by a kicker in a single game is 24. Logan is hoping to beat this record in his next game.

a) Write a linear inequality to represent this situation, then graph.

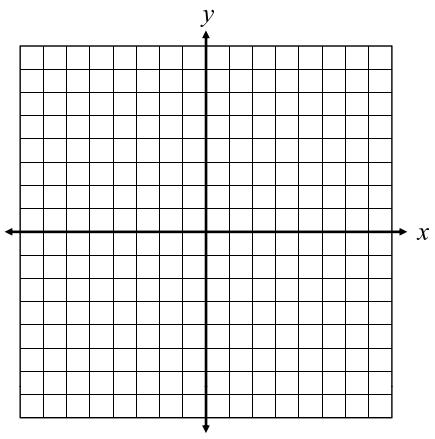
b) Using your graph, give two possible combinations extra point kicks and fieldgoals Logan could score to beat the current record.



Directions: Graph each system of linear inequalities. Clearly indicate the solution region.

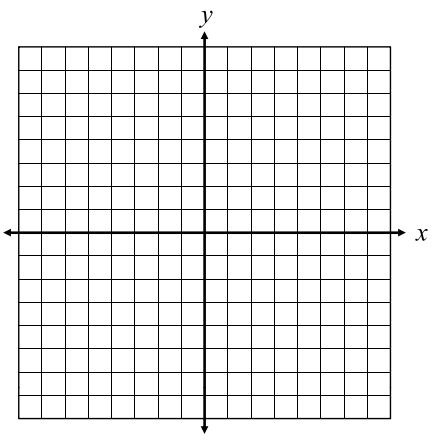
4. $x + 2y \geq -12$

$y < 6x + 7$

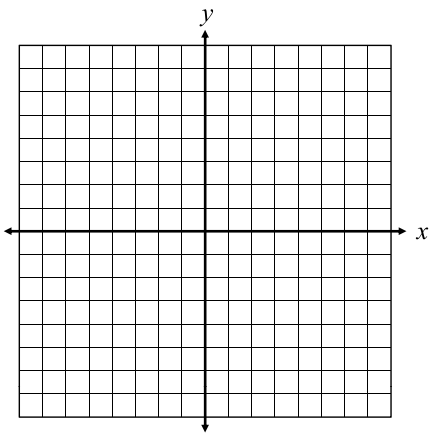


5. $2x - 5y < -20$

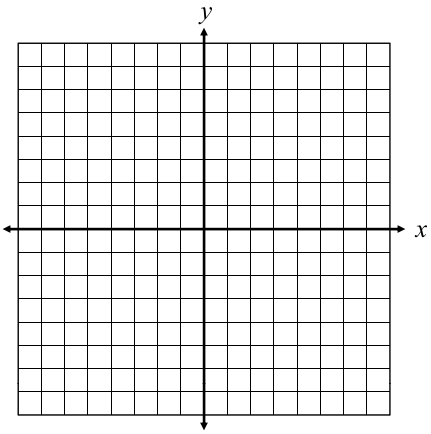
$x > -3$



6. $x - y \geq 4$
$x + 5y \leq 0$

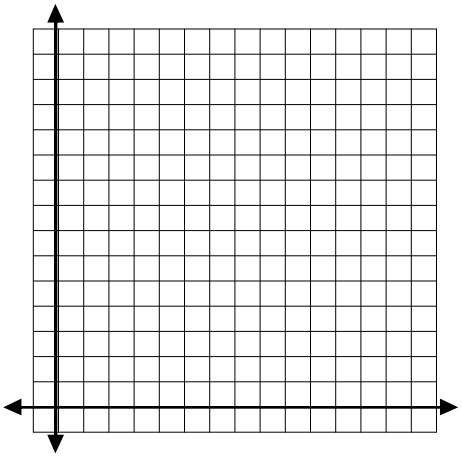


7. $8x - 4y > -28$
$6y \geq 12x - 36$



8. Brandon is shopping at Old Navy during a sale. All shorts are \$16 each and all t-shirts are \$10 each. He has \$100 to spend and would like to purchase at least 2 pairs of shorts.

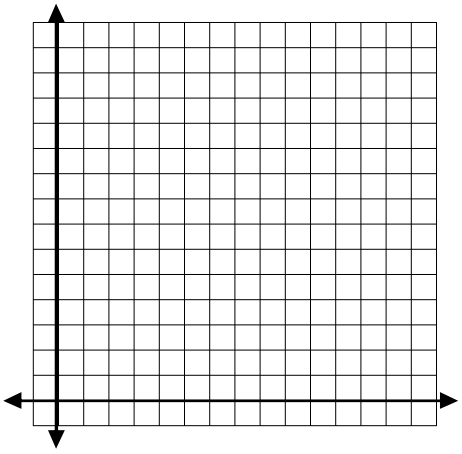
a) Write a system of linear inequalities to represent this situation, then graph.



b) Using your graph, give two possible combinations of shorts and Brandon can buy.

9. Darcy is buying apples and oranges for a large fruit basket to give away as a door prize at a charity event. Apples cost \$0.24 each and oranges cost \$0.80 each. She has \$12 to spend and would like to purchase at least 20 pieces of fruit total.

a) Write a system of linear inequalities to represent this situation, then graph.



b) Using your graph, give two possible combinations of apples and oranges Darcy can buy.