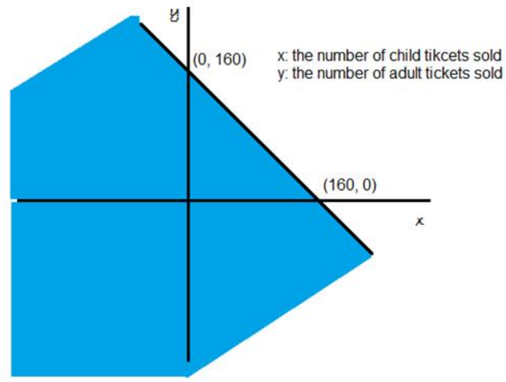
Algebra RH

Essential Question: How do we solve real-world problems of systems of linear inequalities?

Do Now:

The local theater in Kevin's home town has a maximum capacity of 160 people. Kevin shared with Erin the following graph and said that the shaded region represented all the possible combinations of adult and child tickets that could be sold for one show.



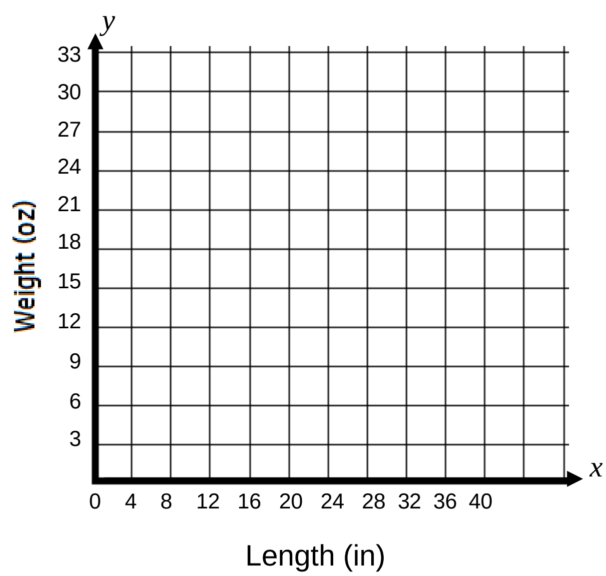
(a) Erin objected and said there was more than one reason that Kevin's thinking was flawed. What reasons could Erin be thinking of?

(b) Using inequalities, describe for Kevin the set of all possible combinations of adult and child tickets that could be sold for one show. What restrictions are on the domain and range?

Systems Of Linear Inequalities: Discrete & Continuous solutions

1) The National Collegiate Athletic Association (NCAA) regulates the lengths of aluminum baseball bats used by college baseball teams. The NCAA states that the length (in inches) of the bat, x, minus the weight (in ounces) of the bat, y, cannot exceed 3. Bats can be purchased at lengths from 26 to 34 inches.

a. Write and graph a system of linear inequalities that describes the information given above. *How many inequalities are needed to represent the situation?*

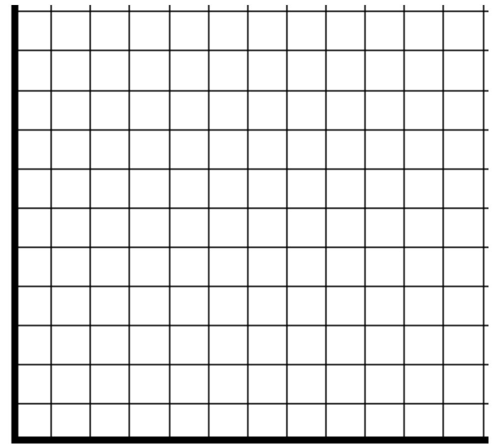


b. Use the graph to determine if an aluminum bat that is 31 inches long and weighs 25 ounces can be used by a player on an NCAA team.

c. State a combination of bat length and weight which would be acceptable according to NCAA regulations.

2) Starr is mixing green, g, and dark purple dye, d, to create a brown dye. She needs less than 100mL of the brown dye. She wants to use at least 20mL more of the green dye than the dark purple dye.

a. Write and graph a system of linear inequalities that describes the information given above.



b. What combinations of dye are possible? Are the solutions discrete or continuous?

Summary...

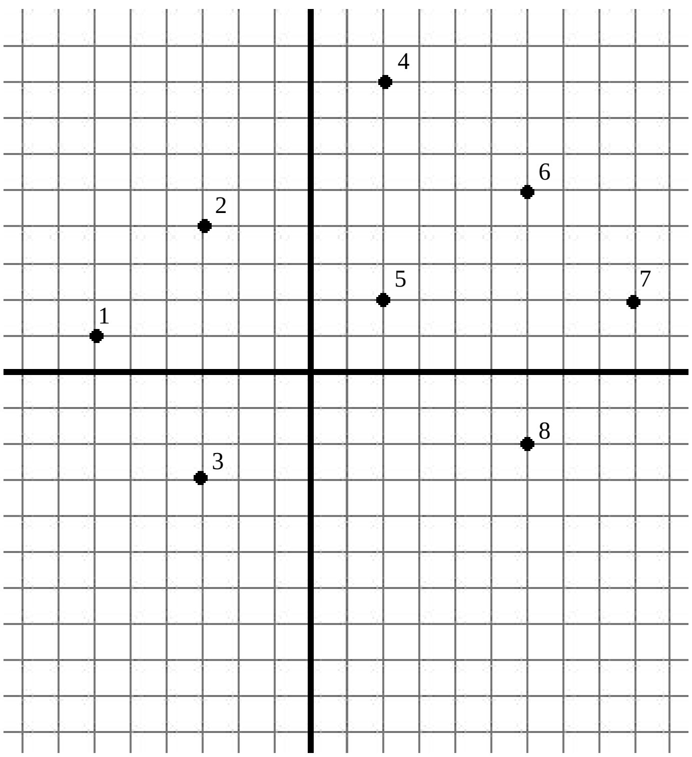
When interpreting the solution region for a linear inequality, consider the restrictions on the ________________ and ________________ of the variables.

- If the solution set is ___________________, all the points in the solution region are in the solution set.
- If the solution set is ___________________, only specific points in the solution region are in the solution set.

Treasure Hunt

An archeologist has discovered a series of coordinates that may represent the location of buried treasure. After deciphering the coded messages, it seems that the only true coordinates of the treasures are those coordinates that lie within the solution of the systems of inequalities.

Potential Treasures may be located at the coordinates designated on the map below. Record the possible locations of the treasures on the lines provided.



1. _______________ 2. _______________ 3. _______________ 4. _______________

5. _______________ 6. _______________ 7. _______________ 8. _______________

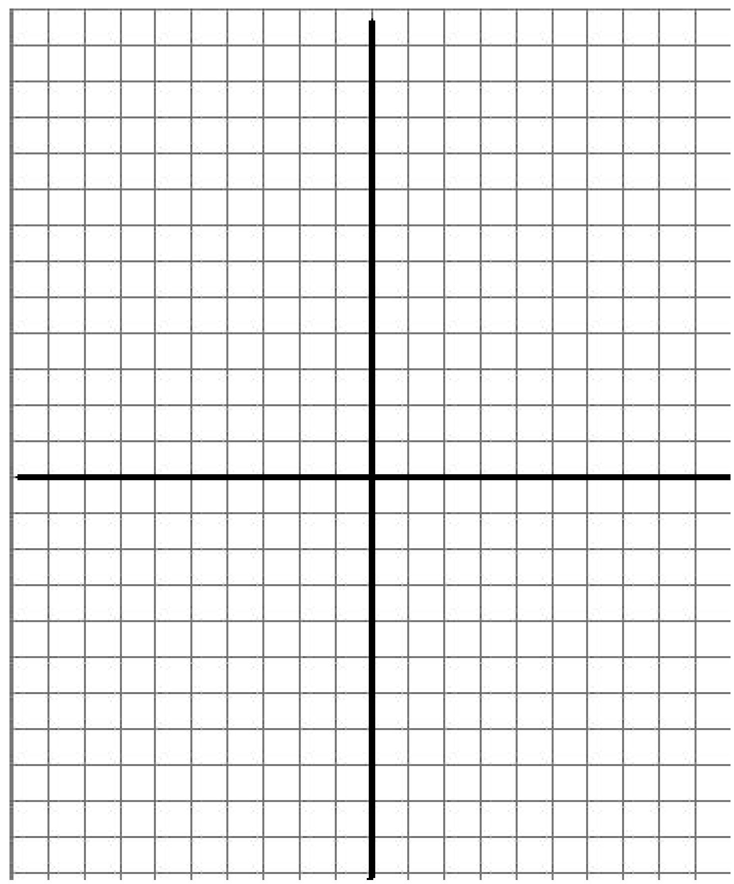
The solution to the following system of inequalities is the location of the treasure. You will need to graph the inequalities on the provided grid. The treasure will be located at the point that lies within the solution of the system of inequalities.

$2x + 3y < 18$

$-4x - 4y < 8$

$-3x + 4y < 12$

$4x - 5y < 20$



State the point where the treasure is located. _______________