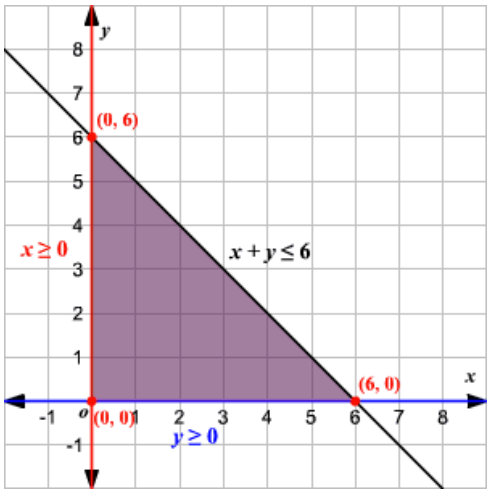
Name: _____

1.8 Lesson: Word Problems

Example:



Vocabulary:

Constraint = _____

Corners/Vertices = _____

Feasible Region = _____

SOLVING WORD PROBLEMS

Step #1 – Define the variables

Step #2 – Consider the restrictions on the numbers in the scenario

Step #3 – Write inequalities (constraints)

Step #4 – Graph solid or dashed lines

Step #5 – Indicate the solution with shading or stipples

Step #6 – Label the corners of the solution space

1) Betsy and Flynn work at an ice cream stand. If Betsy worked three times as many hours as she usually does and Flynn worked twice the number of hours that he usually does, together they would work less that 25 h. The situation can be modeled by the following linear inequality: $3b + 2f < 25$

Step #1 – Define the variables

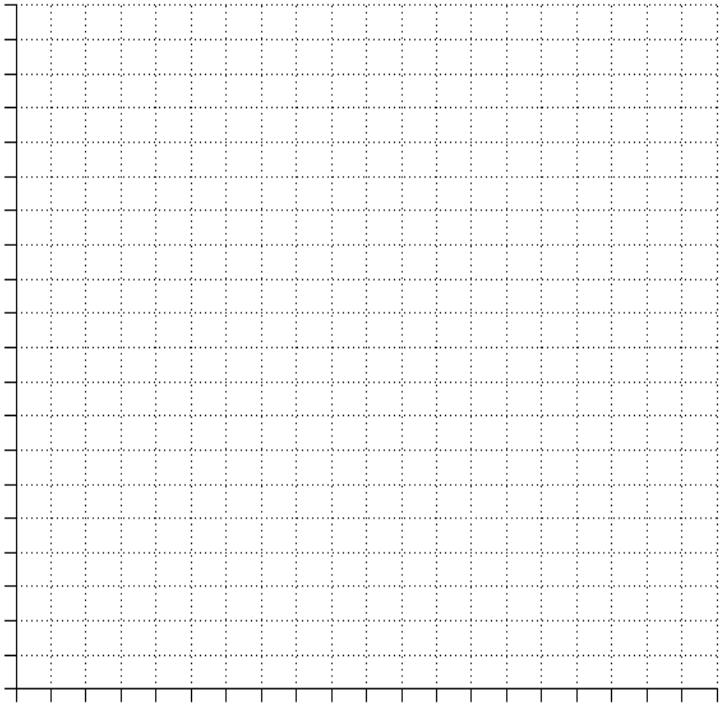
b = _____ *f* = _____

Step #2 – Consider the restrictions on the numbers in the scenario

Restrictions on *b* and *f*? _____

Reals OR Integers OR Whole

Step #3 – Write inequalities (constraints)



Step #4 – Graph solid or dashed lines

Step #5 – Indicate the solution with shading or stipples

Step #6 – Label the corners of the solution space

What does the solution space represent? _____

2) Grace's favorite activities are going to the movies and skating with friends. She budgets herself no more than $75 a month for entertainment and transportation. Movie admission is $9 per movie, and skating costs $5 each time. A student bus pass for the month costs $25.

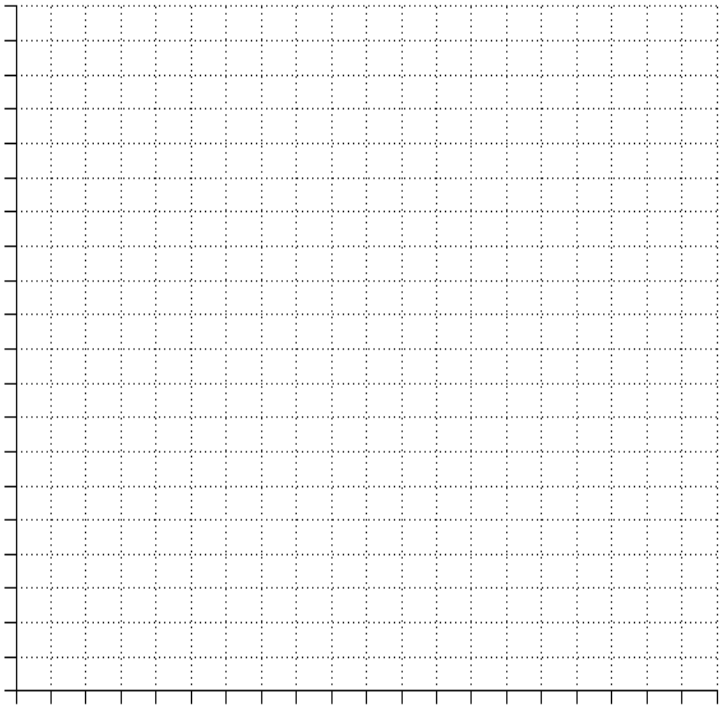
Define the variables:

____ = _____ ____ = _____

Consider the restrictions on the numbers in the scenario

Reals OR Integers OR Whole

Write inequalities (constraints)



Graph solid or dashed lines

Indicate the solution with shading or stipples

Label the corners of the solution space

Use the graph to determine:

1) A combination of activities that Grace can afford and still have some money left over? _____
2) A combination of activities that she can afford with no money left over? _____
3) A combination of activities that will exceed her budget? _____

3) Eamon coaches a hockey team of 18 players. He plans to buy new practice jerseys and hockey sticks for the team. The supplier sells practice jerseys for $50 each and hockey sticks for $85 each. Eamon can spend no more than $3000 in total. He wants to know how many jerseys and sticks he should buy.

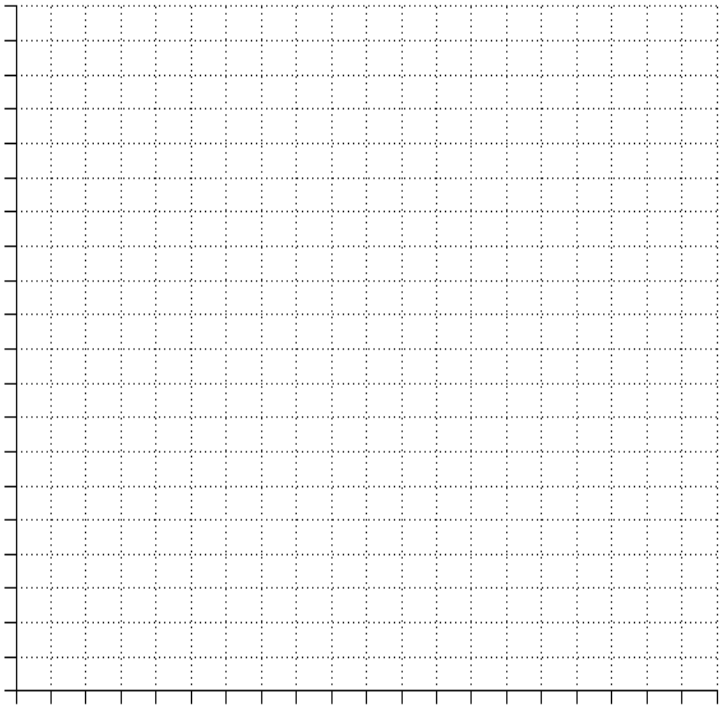
Define the variables:

____ = _____ ____ = _____

Consider the restrictions on the numbers in the scenario

Reals OR Integers OR Whole

Graph the system of inequalities



Determine a reasonable solution to meet the needs of the team, and provide your reasoning:

_____

_____

4) For every teddy bear that is sold at the fundraising banquet, $10 goes to charity. For every ticket that is sold $32 goes to charity. The organizers' goal is to raise at least $5000. The organizers need to know how many teddy bears and tickets must be sold to meet their goal.

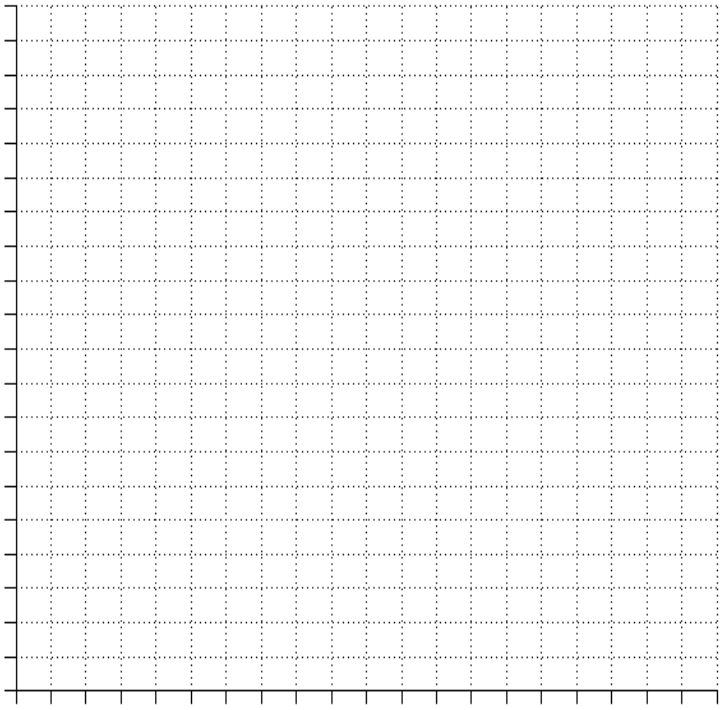
Define the variables:

____ = _____ ____ = _____

Consider the restrictions on the numbers in the scenario

Reals OR Integers OR Whole

Graph the system of inequalities



Which of the following coordinates is in the solution set? (teddy bears, number of tickets)

i) (400,20)

ii) (205,98)

iii) (156,105)

5) On earth day, a nursery sold more than $1500 worth of maple and birch trees. The maple trees were sold for $75, and the birch trees were sold for $50.

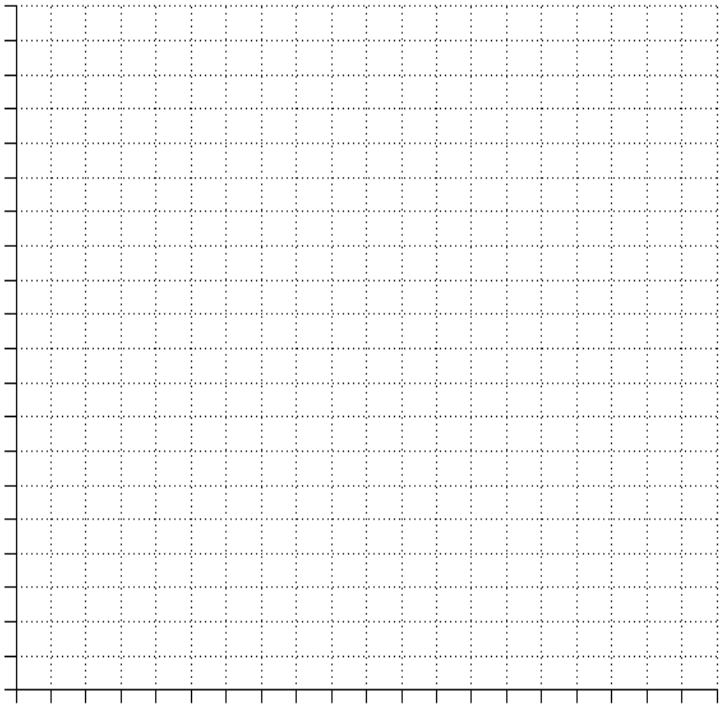
Define the variables:

____ = _____ ____ = _____

Consider the restrictions on the numbers in the scenario

Reals OR Integers OR Whole

Graph the system of inequalities



Use your graph to determine

i) if the nursery could have sold 13 of each type of tree

ii) if 14 of one type and 9 of the other type could have been sold

6) In the fall, Javier plants tulip and crocus bulbs. Each tulip takes up an area of at least 12 square inches, and each crocus takes up an area of at least 9 square inches. Javier has a total area of 35 in. by 50 in. and he wants to plant at least 30 of each type of flower. He wants to know exactly how many of each type of flower he should plant.

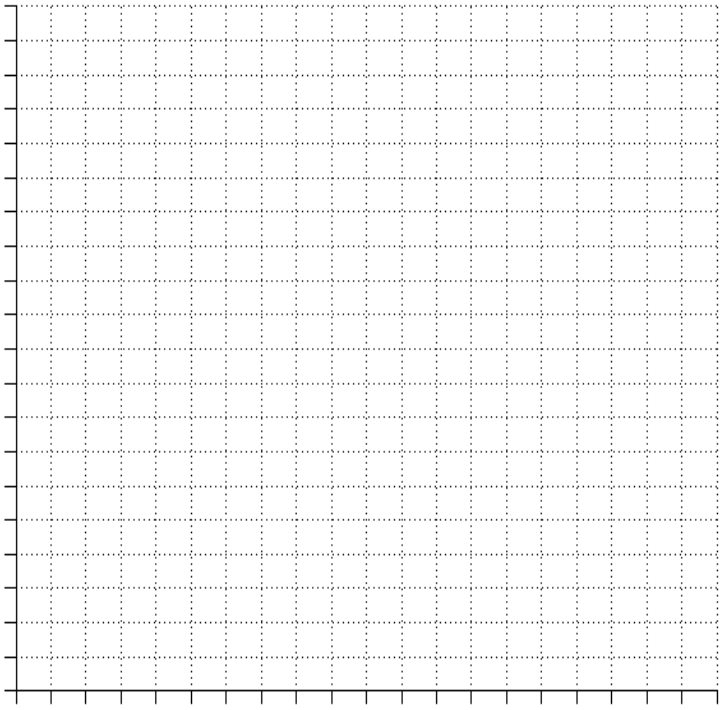
Define the variables:

____ = _____ ____ = _____

Consider the restrictions on the numbers in the scenario

Reals OR Integers OR Whole

Graph the system of inequalities



c) Determine a reasonable solution:

7) The staff in a cafeteria are making two kinds of sandwiches: egg salad, and ham and cheese:

- A maximum of 450 sandwiches are needed.
- Based on previous demand, there should be at least twice as many ham and cheese sandwiches as egg salad sandwiches.

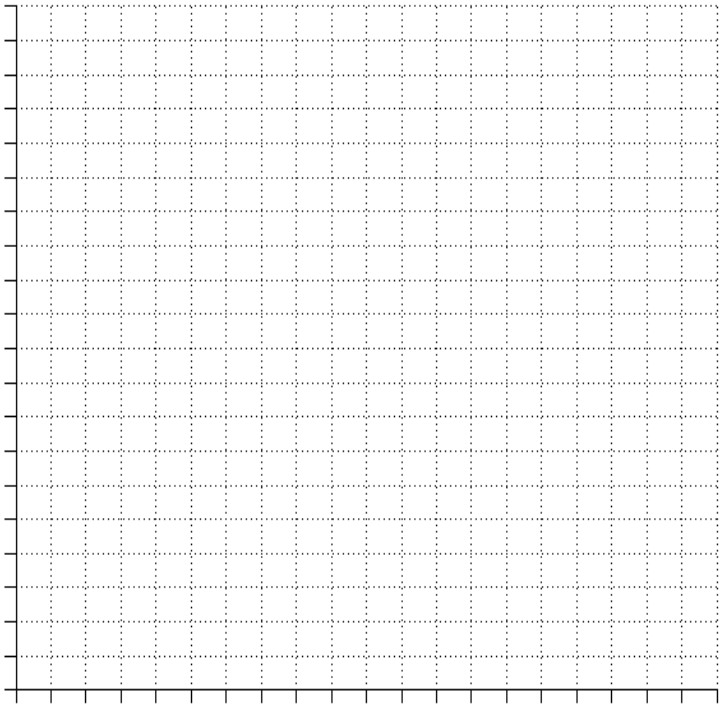
Define the variables:

____ = _____ ____ = _____

Consider the restrictions on the numbers in the scenario

Reals OR Integers OR Whole

Graph the system of inequalities



d) Suggest two combinations of numbers of sandwiches that the cafeteria staff could make:

8) Trish is setting up her social networking page:

- She wants to have no more than 500 friends on her new social networking page
- She also wants to have at least three school friends for every rugby friend.

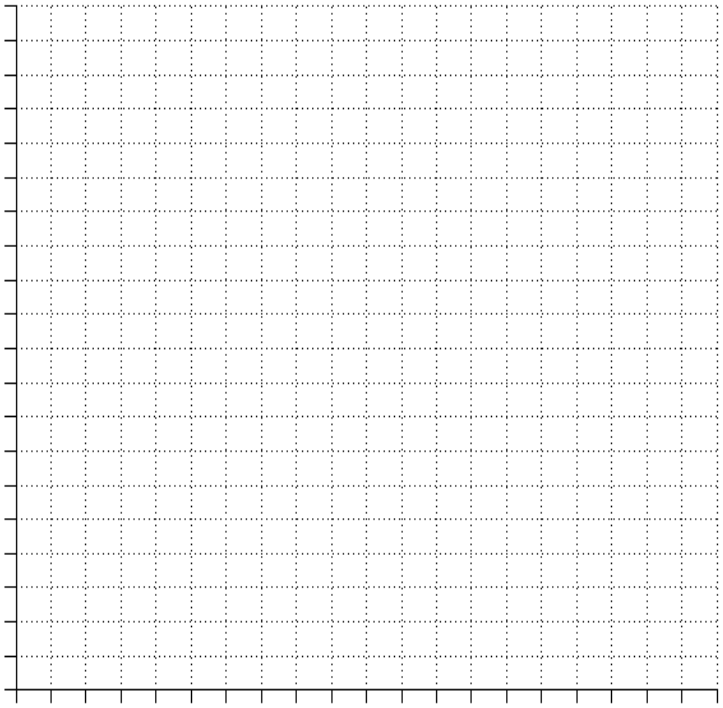
Define the variables:

____ = _____ ____ = _____

Consider the restrictions on the numbers in the scenario

Reals OR Integers OR Whole

Graph the system of inequalities



Two possible combinations: