Name: Key

6.8 Lesson: Word Problems

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: $3b + 2f < 25$

b = Betsy's hours f = Flynn's hours

Restrictions on b and f? greater than zero
less than the total hours in a week

Reals OR (Integers OR Whole)

Continuous OR Discrete

★ assuming you can't work 6.25497 hours for example

i) Boundary: **Dotted OR Solid? Shading OR Stipples?**

ii) Solutions: Above OR Below?

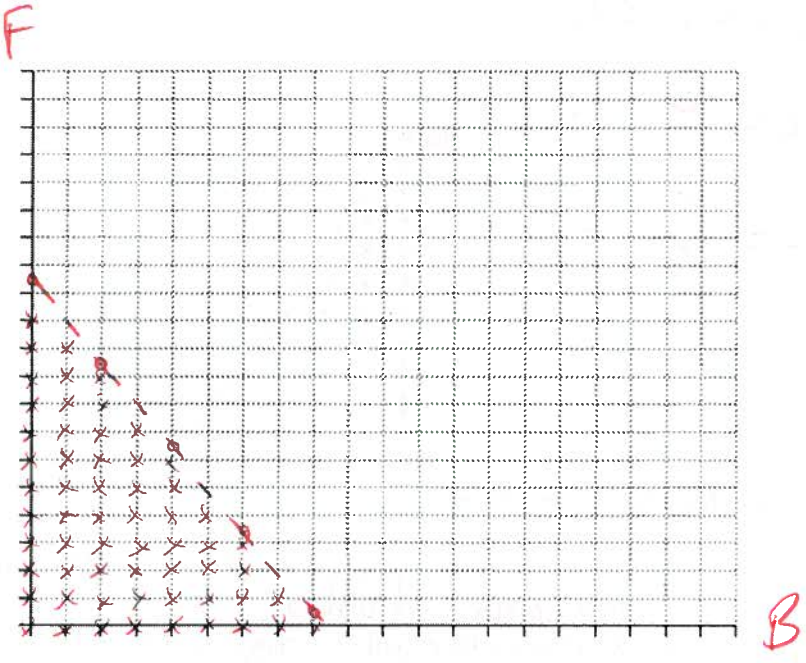
iii) Quadrants: I II III IV

Graph

$3b+2f<25$

$2f<-3b+25$

$f<-\frac{3}{2}b+12.5$



What does the solution space represent? Betsy + Flynn's USUAL hours

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.

a) Define the variables:

M = movies K = skating

Inequality: $9m + 5k + 25 \leq 75$

b) What are the restrictions? positive numbers : how many movies can you see in a month?

Reals OR Integers OR Whole

Boundary: **Dotted OR Solid?** **Shading OR Stipples?**

Solution: Above OR Below?

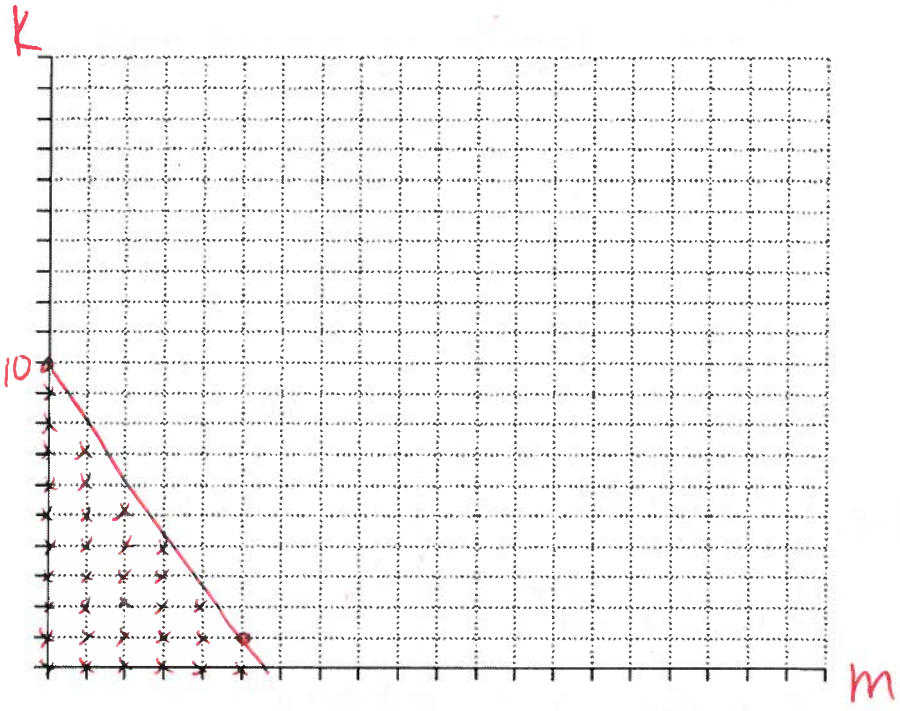
Graph

$9m + 5k + 25 \leq 75$

$9m + 5k \leq 50$

$5k \leq -9m + 50$

$k \leq -\frac{9}{5}m + 10$



Use the graph to determine:

1) A combination of activities that Grace can afford and still have some money left over? any stipples
2) A combination of activities that she can afford with no money left over? any point on the line
3) A combination of activities that will exceed her budget? any point above the line

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.

a) Define the variables:

j = jerseys h = hockey sticks

Inequality: $50j + 85h \leq 3000$ ~~$j \geq 18, h \geq 18$~~

Restrictions? At least 18 of each? How many are for sale?

Reals OR Integers OR Whole

Boundary: **Dotted OR Solid?** **Shading OR Stipples?**

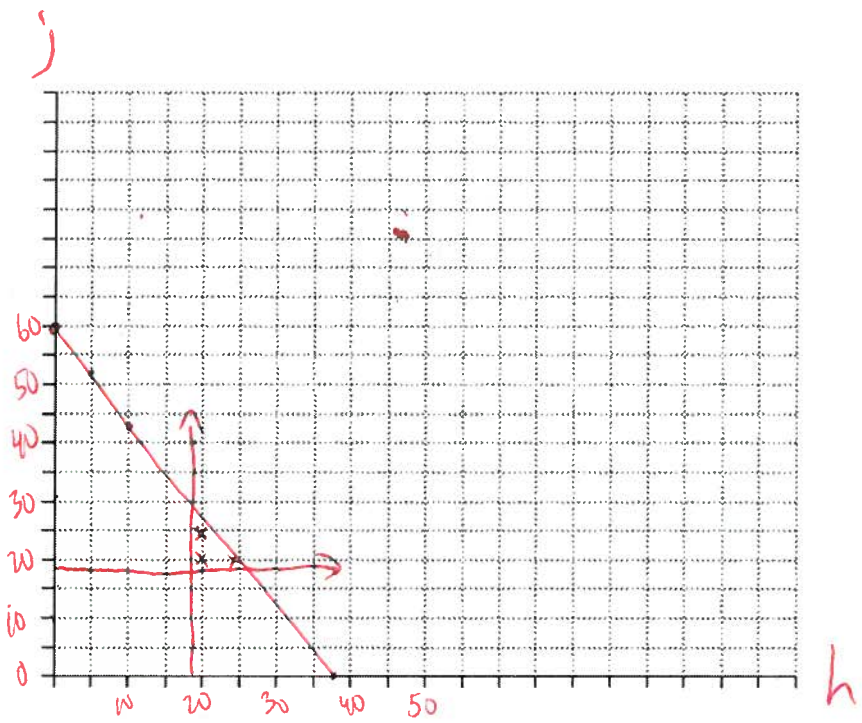
Solution: Above OR Below?

b) Graph

$50j + 85h \leq 3000$

$50j \leq -85h + 3000$

$j \leq -\frac{17}{10}h + 60$



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

20 jerseys / 23 sticks
(2 extra) (5 extra)

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.

a) b = teddy bears t = tickets

Inequality: $10b + 32t \geq 5000$

b) Restrictions? how many teddy bears + tickets do you have?

Reals OR Integers OR Whole

Boundary: **Dotted OR Solid?** **Shading OR Stipples?**

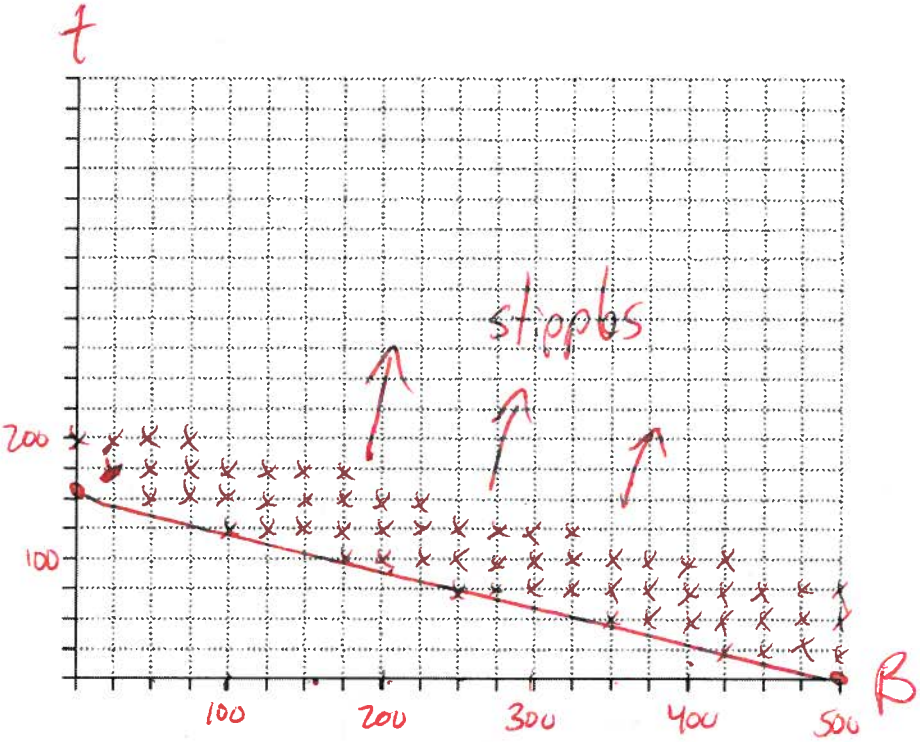
Solution: Above OR Below?

c) Graph

$10b + 32t \geq 5000$

B-intercept = 500

T-intercept = 156.25



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

i) (400,20) No

ii) (205,98) Yes

iii) (156,105) No

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.

a) m = maple trees b = birch trees

Inequality: $75m + 50b > 1500$

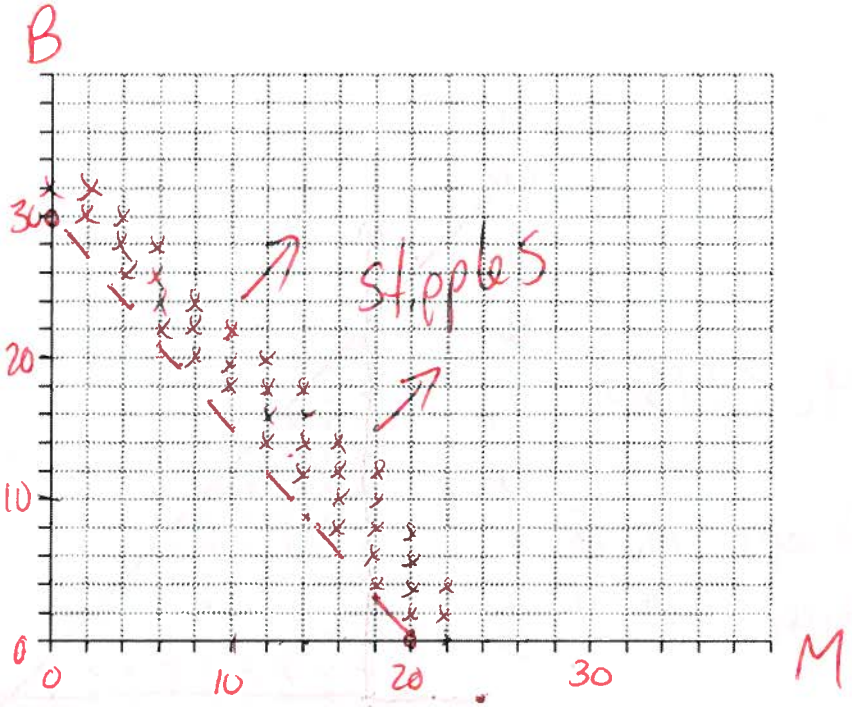
Restrictions? how many trees does the nursery have?

Reals OR Integers OR Whole

Boundary: **Dotted OR Solid?** **Shading OR Stipples?**

Solution: Above OR Below?

b) Graph



$75m + 50b > 1500$

M intercept = 20

B intercept = 30

Use your graph to determine

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

ii) if 14 of one type and 9 of the other type could have been sold No

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.

a) t = tulips c = crocus

Inequality: $12t + 9c \leq 1750$ $t \geq 30$ $c \geq 30$
(35×50)

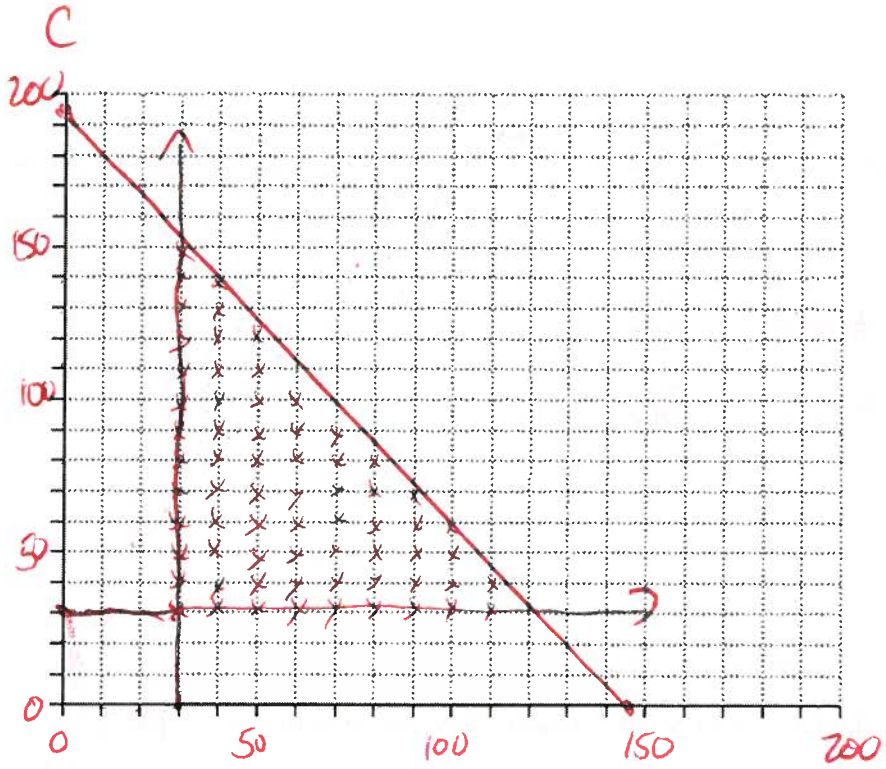
Restrictions? how many do you have?

Reals OR Integers OR Whole

Boundary: **Dotted OR Solid?** **Shading OR Stipples?**

Solution: Above OR Below?

b) Graph



$12t + 9c \leq 1750$

t intercept 145.8
C intercept 194.4

c) Determine a reasonable solution:

any stipples

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.

a) e = egg salad h = ham

Inequality #1: $e + h \leq 450$

Inequality #2: $h \geq 2e$

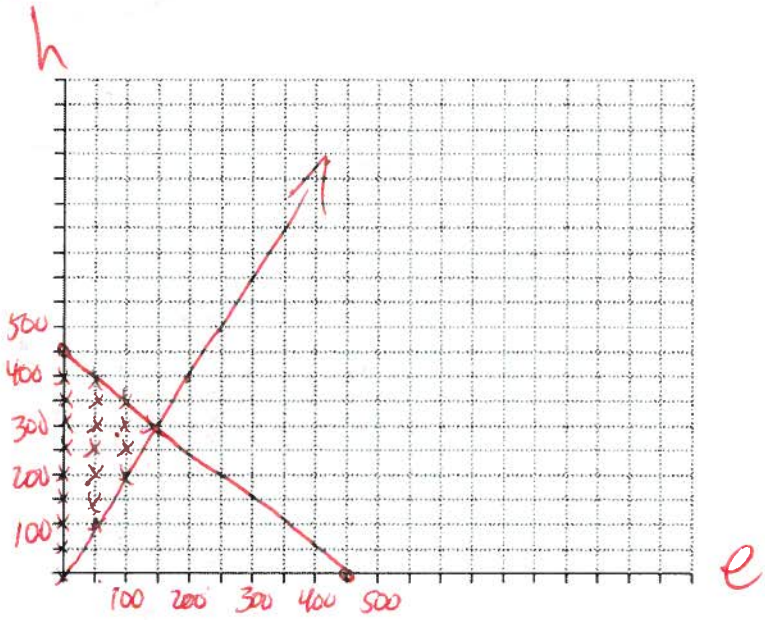
b) Restrictions? no negatives, how much bread/ham/egg do you have?

Reals OR Integers OR Whole

Boundary: **Dotted OR Solid?** **Shading OR Stipples?**

Solution: Above OR Below?

c) Graph



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

50 egg, 300 ham

(any stipples)

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.

a) S = school friends r = rugby friends

Inequality #1: $S + r \leq 500$

Inequality #2: $S \geq 3r$

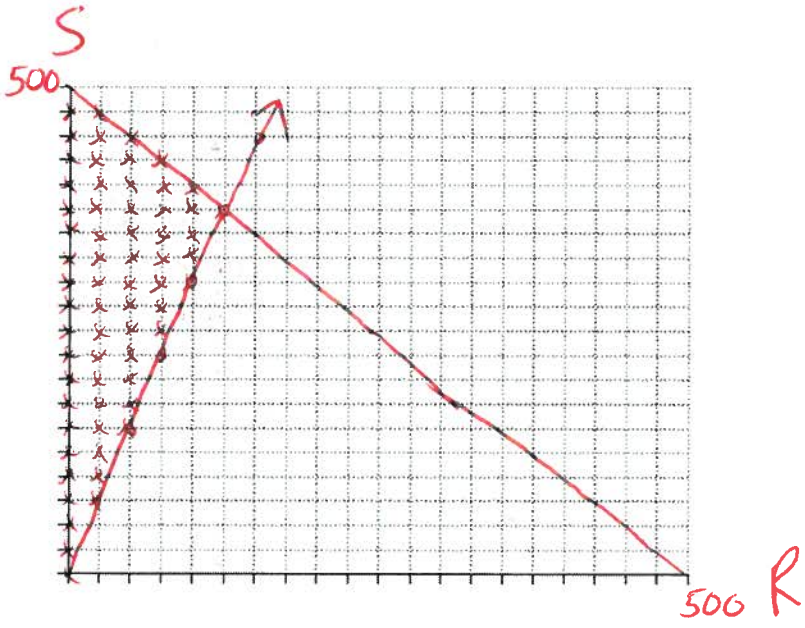
b) Restrictions? how many people in the school?

Reals OR Integers OR Whole

Boundary: **Dotted OR Solid?** **Shading OR Stipples?**

Solution: Above OR Below?

c) Graph



Two possible combinations: