Questions...

p. 252: #1 - 3

p. 259: #1 - 4

3. Meg is building a bookshelf to display her cookbooks and novels.

- She has no more than 50 cookbooks and no more than 200 novels.
- She wants to display at least 2 novels for every cookbook.
- The cookbook spines are about half an inch wide, and the novel spines are about a quarter of an inch wide.

Meg wants to know how long to make the bookshelf.

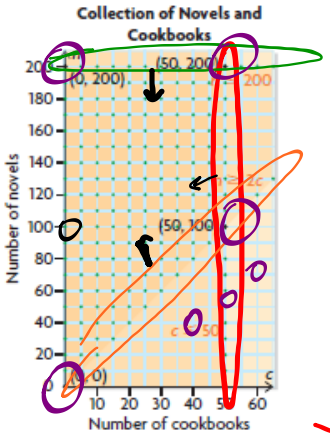
The following model represents this situation.

Let c represent the number of cookbooks.
Let n represent the number of novels.
Let W represent the width of the bookshelf.

Restrictions:
$c \in W, n \in W$

Constraints:
$c \geq 0$
$n \geq 0$
$c \leq 50$
$n \leq 200$
$n \geq 2c$

Objective function:
$W = 0.5c + 0.25n$



a) Which point in the feasible region represents the greatest number of books (both cookbooks and novels) that Meg could have? Explain how you know.
b) Can she display the same number of cookbooks as novels? Explain.
c) What point represents the most cookbooks and the fewest novels?
d) What point represents the number of cookbooks that would require the longest shelf? How long would the shelf have to be?
e) What point represents the number of cookbooks that would require the shortest shelf?

4. Ed found spiders and crickets in his storage room.
   - There were 20 or fewer spiders and 20 or more crickets.
   - There were 45 or fewer crickets and spiders, in total. Spiders have 8 legs, and crickets have 6 legs.

   a) What combination of spiders and crickets would have the greatest number of legs? 20 spiders / 25 crickets
   b) What combination would have the least number of legs? 20 crickets

Objective (sub vertices)

$L = 8x + 6y$

$x \to$ # of spiders
$y \to$ # of crickets

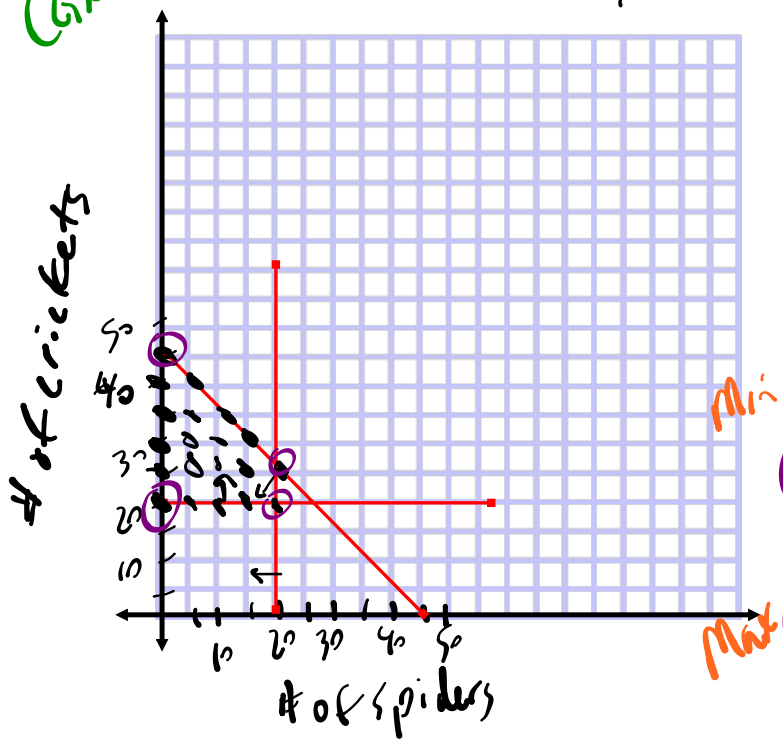
$x \in W$
$y \in W$

Constraints (Graph)

$x \leq 20$
$x = 20$

$y \geq 20$
$y = 20$

$x + y \leq 45$
$x + y = 45$
x-int (45, 0)
y-int (0, 45)



vertex	$L = 8x + 6y$
Min (0, 20)	120 legs
(0, 45)	270
(20, 20)	280
Max (20, 25)	310

ONE MORE...

Malia and Lainey are baking cupcakes and banana mini-loaves to sell at a school fundraiser...

- No more than 60 cupcakes and 35 mini-loaves can be made each day.
- Malia and Lainey can make no more than 80 baked goods, in total, each day.
- It costs $0.50 to make a cupcake and $0.75 to make a mini-loaf.

Determine the maximum cost to produce the baked goods.

$C = 0.50x + 0.75y$

$x \rightarrow$ # of cupcakes $\quad x \in W$

$y \rightarrow$ # of loaves $\quad y \in W$

$x \leq 60$ $\quad x = 60$

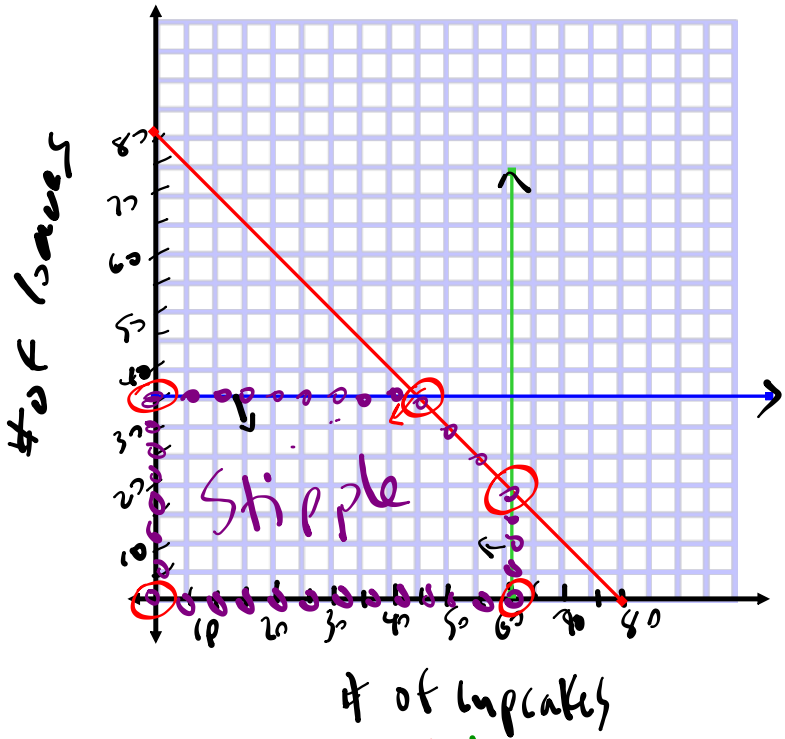
$y \leq 35$ $\quad y = 35$

$x + y \leq 80$

$x + y = 80$

x-int $(80, 0)$

y-int $(0, 80)$



vertex sub $\rightarrow C = 0.5x + 0.75y$

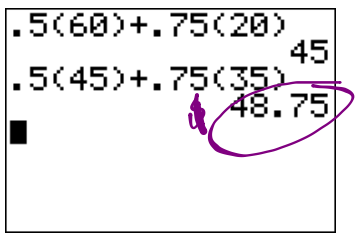
$(0, 0)$

$(0, 35)$

$(60, 0)$

$(60, 20)$

$(45, 35)$



Max Cost

HOMEWORK: p. 259 #5, 7, 8, 11, 13

Test ⇒ THURSDAY

Multiple Choice ⇒ 10-15

Open Response ⇒ 25-40

- #1 → 2 inequations - graph
- #2 → Word problem
- #3 → Optimization (Constraints given)
- #4 → Word problem