Chapter 3
Section 3.4 (Day 2)

EXAMPLE 3
Write the constraints and objective function for the following linear programming problem.

The area of a parking lot is 600 square meters. A car requires 6 square meters and a bus requires 30 square meters. The attendant can only handle 60 vehicles. If a car is charged $2.50 and a bus $7.50, how many of each should be accepted to maximize income?

Step #1 Define the variables. Be SPECIFIC!!!

x = number of cars

y = number of buses

* Look at the question being asked

The area of a parking lot is 600 square meters. A car requires 6 square meters and a bus requires 30 square meters. The attendant can only handle 60 vehicles. If a car is charged $2.50 and a bus $7.50, how many of each should be accepted to maximize income?

x = # of cars y = # of buses

Step #2 Write the Objective function
- usually involves money
- contains information about maximizing or minimizing

$C = 2.50x + 7.50y$

Step #3 Write the constraints. (These are the linear inequalities, look for limitations!)

$6x + 30y \leq 600$

* look for common labels

$x + y \leq 60$

$x \geq 0$
$y \geq 0$ } common sense

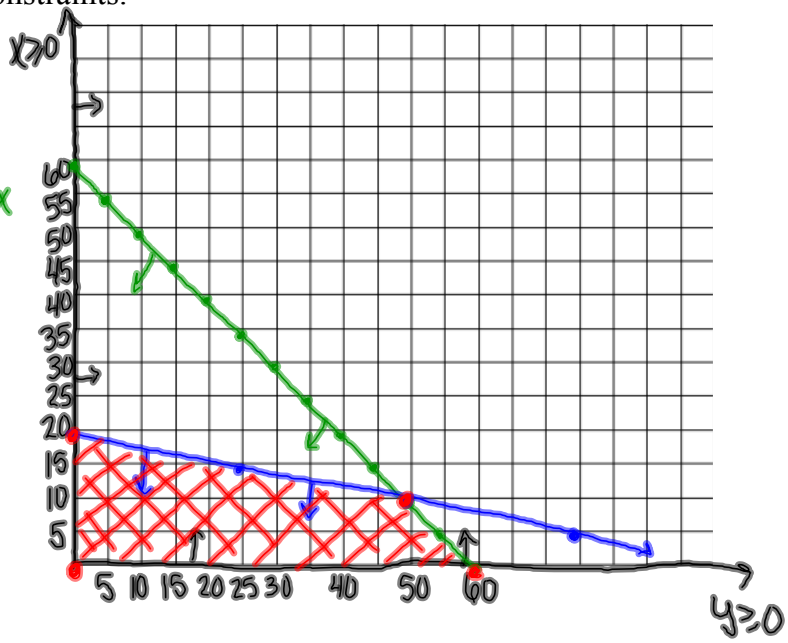
Step #4 Graph the constraints.

$x \geq 0$
$y \geq 0$ } This means you are in quadrant 1

$x + y \leq 60$ $-x$ $-x$ $y \leq 60 - x$

$6x + 30y \leq 600$ $-6x$ $-6x$ 30 30

$y \leq 20 - \frac{1}{5}x$



Step #5 Determine vertices and find max & min values.

Vertices	Value of function $C = 2.50x + 7.50y$
(0,0)	$C = 2.5(0) + 7.5(0) = \$0$
(0,20)	$C = 2.50(0) + 7.5(20) = \$150$
(50,10)	$C = 2.5(50) + 7.5(10) = \$200$ = max profit
(60,0)	$C = 2.5(60) + 7.5(0) = \$150$

Be sure to answer the question being asked

★ 50 cars & 10 Buses will max my profit