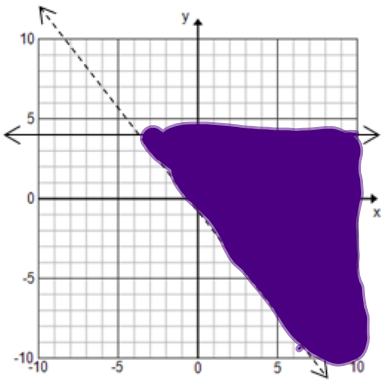
Entrance Ticket

Directions: Shade ONLY the feasible region for the system of inequalities on the right.

1. $\frac{-4}{3}x - 1 < y$

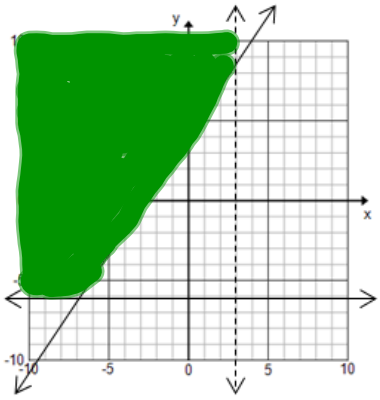
   $y \leq 4$



2. $2x + 4 \leq y$

   $y \geq -6$

   $x < 3$



P-33

1.3C *Linear Programming – Finding Vertices Graphically*

9) A carpenter makes tables and chairs. Each table can be sold for a profit of $30 and each chair for a profit of $10. The carpenter can afford to spend up to 42 hours per week working and takes six hours to make a table and three hours to make a chair. The carpenter has a small shop and has limited room for storage. He has only 40 cubic feet available for storage. Chairs take 5 cubic feet of storage, fortunately the tables are collapsible and only take 4 cubic feet of storage.

a) Identify the variables and label the axes.

t: # of tables
c: # of chairs

b) Determine the objective function used to maximize the profit.

equation
$30t + 10c = P$

P: profit

c) Write the constraints as a system of inequalities.

non-negative constraints

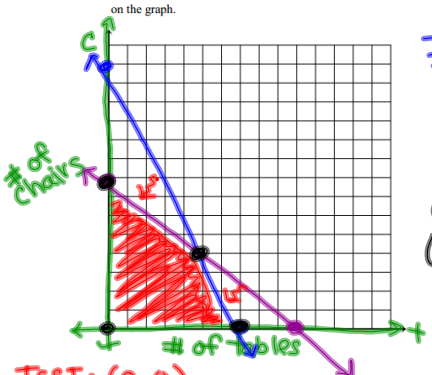
Minimum number of tables: $t \geq 0$

Minimum number of chairs: $c \geq 0$

Time available: $6t + 3c \leq 42$

Storage available: $5c + 4t \leq 40$

d) Graph the constraints on the grid. Find (and list) the vertices of the feasible region and label them on the graph.



t	c
7	0
0	14

$6t + 3(0) = 42$
$6t = 42$
$t = 7$

$6(0) + 3t = 42$
$\frac{3t}{3} = \frac{42}{3}$
$t = 14$

VERTICES:

(0,8), (7,0)
(0,0), (5,4)

Section 1.3C

TEST: (0,0)
$6(0) + 3(0) \leq 42$ T
$5(0) + 4(0) \leq 40$ T

t	c
10	0
0	8

$5c + 4t = 40$

Learning Target: I can find vertices using graphing technology.

1.3D Linear Programming - Finding Vertices Algebraically

Section 1.3D

Up to this point, you have worked with linear programming problems by:

1) Writing and graphing a system of inequalities,
2) Finding the feasible region for the system,
3) Locating the vertices on the graph of the feasible region graphically

Most real-life situations though, do not have solutions that are whole numbers such as the solutions for Larry's Lawn Service and Cam's spring planting. **In situations where the vertices are not easily found, we use algebraic methods to solve for them.**

Finding Vertices Using Graphing Technology

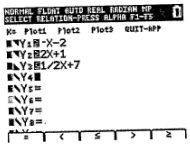
Find the vertices and shade with the calculator.

To get the inequality sign hit ALPHA then select the sign

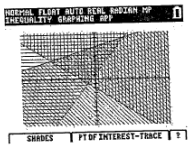
$y \geq -x-2$

$y \geq 2x+1$

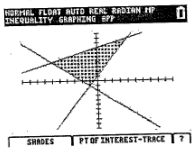
$y \leq \frac{1}{2}x+7$



Graphed

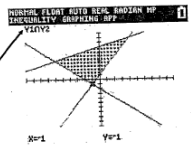


Hit Alpha F1, #1



Hit Alpha F3 and use your down and up and left and right arrow buttons.

Notice the 2 lines that we are finding the intersection for.



Solutions (-1,-1), (-6,4), (4,9)

HOMEWORK TONIGHT:

	10/3	I Can Represent Real-World Situations as a Linear Programming Problem and	1.3C #6,7 (P-31)	# of Questions =	☹ 😐 ☺
	1.3 10/7		1.3D #9 (P-33) #6-9 (P-36)	Points =	