Name: _____ Class: _____ Date: _____ ID: A

Lesson #5 GUIDED PRACTICE INTRO LESSON: Using Linear Programming to help Solve Real World Linear Applications (Reference: Lesson #54 in text book)

Problem

1. **LESSON GOALS:**
   - ☐ ***Students will be able to establish the two unknowns.***
   - ☐ ***Students will be able to create the OBJECTIVE FUNCTION and the CONSTRAINTS placed on problem.***
   - ☐ ***Students will be able to use their IPad to determine the FEASIBLE REGION from their CONSTRAINTS.***
   - ☐ ***Students will be able to use their IPad to determine the CRITICAL POINTS of the FEASIBLE REGION.***
   - ☐ ***Students will be able to use those CRITICAL POINTS or the data from their IPads to analyze and determine the most optimal solution to their specific application.***

IMPORTANT DEFINITIONS: (Write the definitions we come up with durring class)

Linear Progamming:

Objective Function:

Constraints:

Feasible Region:

Critical Points:

POD APPLICATION #1: Determining the *MOST OPTIMAL SOLUTION* to MAXIMIZE your companies profits in the following application!!!

The XYZ corporation produces two types of cereal: Healthy One, which use 4 oz. of wheat, and 1 ounce of sugar, and Rot Your Teeth Out, which uses 3 ounces of sugar and 2 ounces of wheat per box. The profit for Healthy One, is $1.75 a box, and for Rot Your Teeth Out, $2.25 a box. Available are 10,000 ounces of wheat, and 12,000 ounces of sugar. How much of each kind of cereal should the XYZ corporation make to maximize it's profit?

*****LETS USE WHAT WE HAVE LEARNED IN THE PREVIOUS LESSON TO HELP ESTABLISH A PROCESS OR PROCEDURE TO ATTACKING THIS PROBLEM!!!!**

***STEP #1*-ESTABLISH _____ (Similar to what we did in the Applications to Systems of equations)**

Let X= Let Y=

Name: _____ ID: A

STEP #2-CREATE YOUR _____

PROFIT=

STEP #3- CREATE YOUR _____ PLACED UPON THE _____ (Follow the same process as we did when we created equations in the Applications of Systems of equations)

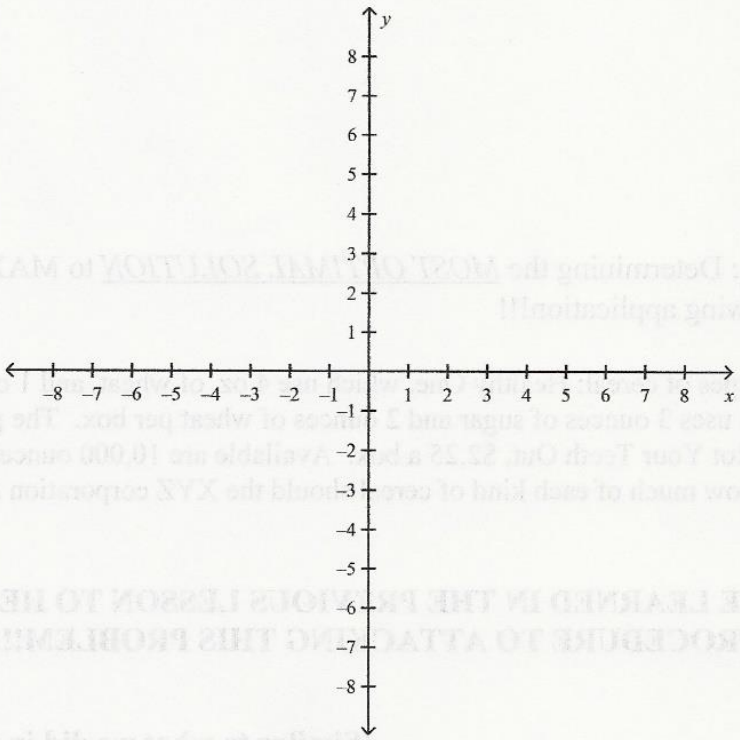
1st Constraint:

2nd Constraint:

3rd Constraint:

4th Constraint:

STEP#4- GRAPH AND FIND THE _____ (Use your IPad and draw a quick sketch of what the graph looks like below)



STEP #5-BASED ON THE GRAPH DETERMINE THE _____ THAT BOUND MY _____-(Use you IPad to find these Critical Points. Write these critical points down and label them on the above graph)

1st Critical Point:

2nd Critical Point:

3rd Critical Point:

4th Critical Point:

***STEP #6*-ANALYIZE YOUR DATA AND DETERMINE**

_____- (Use your critical points and your objective function to determine the optimal solution and state what that profit will be.)

OPTIMAL SOULTION IS TO PRODUCE:

MAX PROFIT IS:

POD ACTIVITY #2 (Determining a Process behind Solving these Linear Programming Applications): In your pods determine a step by step process of what needs to be done from begining to the end of the Linear Programming Application process.

Step-by Step Process:

STEP #1: _____
_____.

STEP #2: _____
_____

STEP #3: _____
_____

STEP #4: _____
_____

STEP #5: _____
_____

STEP #6: _____
_____

POD APPLICATION #2: Determining the *MOST OPTIMAL SOLUTION* to MAXIMIZE your companies profits in the following application!!!

Name: _____ **ID: A**

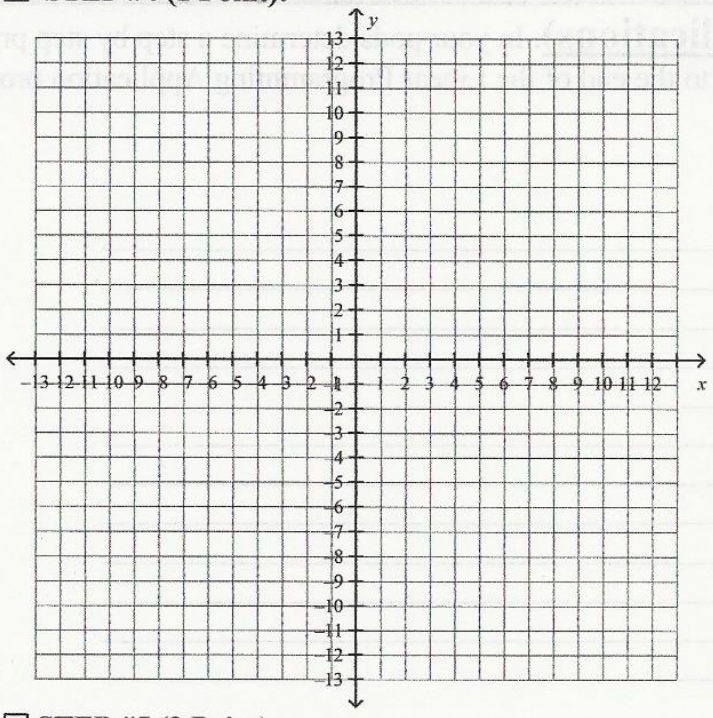
A company makes two models of MP3 players. The M20 takes 3 hours to manufacture and the M25 takes 1 hour. The company has multiple shifts and has a 20-hour day for manufacturing the players. The M20 generates a profit of $12, and the M25 a profit of $7. The M20 uses 15 special chips, while the M25 uses 10. For the next manufacturing cycle, consisting of 18 days, there are 3,000 chips available. How many of each type of MP3 players should the company produce ot maximize its profits? What combination of MP3 players would result in the least amount of profit, assuming they actual product MP3 players?

☐ **STEP #1 (1 Point):**

☐ **STEP #2(1 Point):**

☐ **STEP #3 (2 Point):**

☐ **STEP #4 (1 Point):**



☐ **STEP #5 (2 Point):**

☐ **STEP #6 (2 Point):**