Name: ______________________________

2.5.D3 – LINEAR PROGRAMMING

Past due on: _______________ Period: ______

Complete the linear programming problem.

1. At the end of every month, after filling orders for its regular customers, a coffee company has some pure Colombian coffee and some special-blend coffee remaining.

   The practice of the company has been to package a mixture of the two coffees into packages as follows: a low-grade mixture containing 4 ounces of Colombian coffee and 12 ounces of special-blend coffee and a high-grade mixture containing 8 ounces of Colombian and 8 ounces of special-blend coffee.

   This month, 1920 ounces of special-blend coffee and 1600 ounces of pure Colombian coffee remain.

   The company want to maximize its profits. A profit of \$0.30 per package is made on the low-grade mixture, whereas a profit of \$0.40 per package is made on the high-grade mixture.

   How many packages of each mixture should be prepared to achieve a maximum profit? What is the maximum profit?

   Let x = the packages of the low-grade mixture; y = the packages of the high-grade mixture

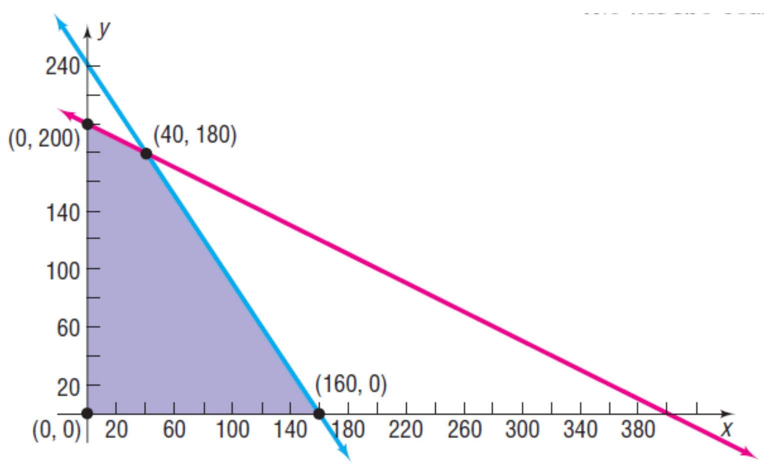
Write a system of equations and a function to be maximized:

	x	y	TOTAL
COLOMBIAN			
SPECIAL-BLEND			
PROFIT			$= f(x, y)$

Use the graph shown (below) & find the coordinates & the vertices & evaluate:

(x, y)	$f(x, y)$

Answer the problem:



PROBLEMS 2 & 3:

ALL GRAPHING FOR LINEAR PROGRAMMING PROBLEMS SHOULD BE DONE ON WWW.DESMOS.COM

For each of the following problems:

a. Write a function to be minimized: $f(x, y)$
b. Write a system of inequalities: $x \geq 0, y \geq 0$
c. Graph on Desmos and then find the coordinates of the vertices of the feasible region and substitute them into the function from part a.
d. Answer the problem.

2. A manufacturer produces two models of mountain bicycles: Model A and Model B.

The times required for assembling is 5 hours for Model A & 4 hours for Model B. The time required for painting is 2 hours for Model A & 3 hours for Model B.

The maximum total weekly hours available in the assembly department and the paint department are 200 hours and 108 hours, respectively.

The manufacturer wishes to maximize profits. The profits per unit are $25 for Model A and $15 for Model B.

How many of each type should be produced to maximize profit? What is the maximum profit?

Let x = the units of Model A; y = the units of Model B.

Write a system of equations & a function to be maximized

	x	y	TOTAL
ASSEMBLING TIME			
PAINTING TIME			
PROFIT			$= f(x,y)$

Find the coordinates & the vertices & evaluate:

(x,y)	$f(x,y)$

Answer the problem:

3. Kevin's dog Amadeus likes two kinds of canned dog food: Gourmet Dog and Chow Hound.

Gourmet Dog costs $0.40 a can and has 20 units of a vitamin complex; the caloric content is 75 calories.

Chow Hound costs $0.32 a can and has 35 units of a vitamins and 50 calories.

Kevin likes Amadeus to have at least 1175 units of vitamins a month and at least 2375 calories during the same time period.

Kevin has space to store only 60 cans of dog food at a time.

Kevin wishes to minimize his costs. How much of each kind of dog food should Kevin buy each month to minimize his cost? What is the cost?

Let x = the cans of Gourmet Dog; let y = the cans of Chow Hound

Write a system of equations & a function to be minimized:

	x	y	TOTAL
VITAMINS			
CALORIES			
CANS			
COST			$= f(x,y)$

Find the coordinates & the vertices & evaluate:

(x,y)	$f(x,y)$

Answer the problem: