Exam 2 Practice Problems

Part I – Linear Programming

1. A linear programming problem has an objective function $f = 3x - 4y$ on the region

$$4x + 5y \le 20$$
$$x - 3y \le 0$$
$$x \ge 1$$

What are the maximum and minimum values of *f* and where are they located?

2. A linear programming problem has an objective function $f = 2x + 8y$ on the region

$$5x + 2y \ge 15$$
$$2x + 3y \ge 12$$
$$x + 4y \ge 10$$
$$x \ge 0,\ y \ge 0$$

What are the maximum and minimum values of *f* and where are they located?

3. Set up the following Linear Programming problem
Farmer Blue has 175 plots available to plant short- and long-stemmed strawberries. Each plot of long-stemmed strawberries will yield 40 baskets of strawberries and each plot of short-stemmed will yield 60 baskets of strawberries. He wants to have at least three times as many baskets of long-stemmed strawberries than he does of short-stemmed strawberries. The long-stemmed will sell for $4.00 per basket and the short-stemmed will sell for $3.00 per basket. How many plots of each type of strawberry should Farmer Blue plant to maximize his revenue?

4. A manufacturer makes two types of products: widgets and gadgets. Each widget and gadget needs to be fabricated, polished and wrapped as shown in the table below:

	fabrication minutes	polishing minutes	wrapping minutes	Profit
widget	9	12	11	$3
gadgets	9	10	6	$5
available time	288 minutes	338 minutes	275 minutes	

How many of each type of product should be produced to realize a maximum profit? What is the maximum profit? What, if anything is leftover?