Math 241 F1H: Problem Set 6

Due date: In class on Tuesday, March 4.

1. A small company produces two products: widgets and spatulas. Each product requires the use of three machines, a grinder, a crusher, and an oven. Below is the length of time, in hours, that it takes to make a single product:

	grinder	crusher	oven	total
widgets	0.5	0.4	0.2	1.1
spatulas	0.25	0.3	0.4	0.95

   The grinder is available for use 40 hours a week, but the other two machines are only available 36 hours a week due to warmup time. Suppose that the profit from making a widget is $5 and a spatula $3. How many widgets and spatulas should be produced each week to maximize profit?

2. Consider the constraints:

$$3x + 2y + 3z \le 3, \quad x + 2y \le 2, \quad \text{and} \quad x, y, z \ge 0.$$

   (a) Maximize $f(x, y, z) = x + 2y + z$ subject to the above constraints.

   (b) Maximize $f(x, y, z) = 2x + 2y - z$ subject to the above constraints.

3. Section 3.1 #3.

4. Section 3.1 #15.

5. Section 3.1 #29.

6. Section 3.3 #15.

7. Section 5.1 #20.

8. Section 5.1 #22.

9. Section 5.2 #1 and #2.

10. Section 5.2 #9.

11. Section 5.2 #17.

12. Section 5.2 #26.

13. Section 5.3 #1 and #2.

14. Section 5.3 #15.

Note: This assignment is complete.