

Homework 1 - Math 381 A - Autumn 2015 - Dr. Matthew Conroy

1. (a) Solve the following LP graphically by hand. Include figures and a detailed description of your method. Minimize $x + y$ subject to

$$10x + 3y \leq 60$$

$$5x + 6y \geq 50$$

$$y - 3x \leq 2$$

- (b) Maximize $x + y$ subject to the same constraints. (Feel free to recycle figures).
2. You own a company that produces Widgets and Doohickies. You have two factories.
Factory A produces 100 Widgets and 90 Doohickies per day.
Factory B produces 40 Widgets and 95 Doohickies per day.
It costs \$10000 per day to run Factory A and \$7000 per day to run Factory B.
You have an order for 3000 Widgets and 2000 Doohickies. For how many days (fractions are okay) should each factory be run to minimize the cost to fulfill this order?
3. Consider the salsa-and-guacamole scenario from Friday's lecture. Suppose we sell salsa for \$1 per unit, and guacamole for \$ z per unit. Depending on the value of z , we would maximize revenue by making all salsa, all guacamole, or some of each. Describe the range of z values corresponding to each type of solution, and give plenty of justification.