Introduction to Optimization
MS&E 111/ENGR 62, Autumn 2007-2008, Stanford University
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Handout 2: Lab 1. Lab date - 10/5/07

(Modified from 3.9 in VRM) The Apex television company has to decide on the number of 27 and 20 inch tv sets to be produced at one of its factories. Market research indicates that at most 40 of the 27 inch sets and 10 of the 20 inch sets can be sold per month. The maximum number of work-hours available is 360 per month. A 27 inch set requires 10 work hours, and a 20 inch set requires 8 work hours. Each 27 inch set sold produces a profit of $120 and each 20inch set produces a profit of $80. A wholesaler has agreed to purchase all of the sets (at market price) produced if the numbers do not exceed the amounts indicated by the market research.

a) Formulate this linear program and solve for maximum profit in Excel.

b) Now assume that the wholesaler has requested at least 5 20 inch sets. Reformulate the LP and solve. How does the profit compare to that in part a).

c) After further research, the wholesaler has concluded that he would only be willing to take 30 27 inch sets at market price, but would take the other 10 27 inch sets at a price that would provide a profit of $100 per set. Assuming Apex has no other distribution alternatives, reformulate the LP (with this condition as well as the one from part b) and solve.