OR Homework 1: Dogs and Buns (from Hillier, Intro to Operations Research)

Dogs and Buns is a food processing plant which manufactures both hot dogs and hot dog buns. They grind their own flour for the hot dog buns at a maximum rate of 200 pounds per week. Each hot dog bun requires 0.1 pounds of flour. They currently have a contract with Pork Plus, for 800 pounds of pork product delivered each week. Each hot dog requires ¼ pound of pork product. All the other ingredients in the hot dogs and hot dog buns are in plentiful supply. Finally, the labor force at Dogs and Buns consists of 5 employees working full time (40 hours per week each). Each hot dog requires 3 minutes of labor, and each hot dog bun requires 2 minutes of labor. Each hot dog yields a profit of $0.88 and each bun yields a profit of $0.33.

Dogs and Buns would like to know how many hot dogs and how many hot dog buns they should produce each week so as to achieve the highest possible profit.

1. Formulate a model for this problem.

2. Use desmos to solve this model.

3. Should Dogs and Buns consider hiring a sixth full-time employee? (why / why not?)

4. Write a paragraph to Dogs and Buns with your suggestions.