MA104 - Differential Calculus
Lesson 53: Solving Multivariate Optimization Problems II

During Camp Buckner this summer, you and your friends form a small company to make souvenirs for online sale out of used cadet uniform material. You design a stuffed cadet and outfit it with full dress jackets and pants. A .com buys your idea and wants you to produce the dress gray jackets and pants for separate sale. You decide you can employ 200 skilled plebes (class of '11!!!) able to make either product. Each plebe puts in 8 hours each Saturday and is paid $10 an hour. You can get up to 1000 square feet of gray material delivered each week from the laundry plant (they say it is no problem to inadvertently snag a few items of clothing each week) to support production. The laundry plant charges $2 per square foot. It takes a plebe 50 minutes to complete a jacket and uses 1.2 square feet of material. A plebe can make a pair of gray pants in 30 minutes using 0.9 square feet of material. The buyers will pay $25 for a jacket and $20 for a pair of pants. The .com company wants a mix of articles and doesn't want more than three pairs of pants for every jacket produced. How many dress gray jackets and how many pair of pants should you produce each week in order to maximize profits?

1. Name your variables. Then write down your objective function.

2. What are the contstraints on the problem?

3. How can we use these to finish off our analysis and complete the problem?