Part 6

Applied Optimization

Question 6.1. What is the smallest perimeter possible for a rectangle whose area is 25 square inches, and what are its dimensions?

Question 6.2. You are planning to make an open rectangular box from an 8 inch by 15 inch piece of cardboard by cutting congruent squares from the corners and folding up the sides. What are the dimensions of the box of largest volume you can make this way, and what is its volume?

Question 6.3. A rectangular plot of farmland will be bounded on one side by a river and on the other three sides by a single-strand electric fence. With 800 m of wire at your disposal, what is the largest area you can enclose, and what are its dimensions?

Question 6.4. A 216 m^2 rectangular pea patch is to be enclosed by a fence and divided into two equal parts by another fence parallel to one of the sides. What dimensions for the outer rectangle will require the smallest total length of fence? How much fence will be needed?

Question 6.5. You are designing a rectangular poster to contain 50 square inches of printing with a 4-inch margin at the top and bottom and a 2-inch margin at each side. What overall dimensions will minimize the amount of paper used?