

U-Pack-Em sells cardboard boxes for the do-it-yourself mover. Their most popular size has a volume of 2 cubic feet. As shown in the figure below, the top and bottom are made using four flaps. The price of cardboard is $\$0.20/\text{ft}^2$. What are the raw materials cost and dimensions for the cheapest box that can be manufactured. (Be sure to show that it is, in fact a minimum by looking at the Hessian Matrix.)

