

Design a building in the shape of a rectangular box to minimize the annual heating costs given the volume of the building is to be 12,000 cubic feet. The heating costs for the well insulated flat roof are \$2 per square foot, the heating costs for the front & back that have less efficient windows and doors are \$4 per square foot, and the costs for the left and right sides are \$3 per square foot. Find the dimensions of the building so the heating costs are minimized. Also, find the minimum heating cost.