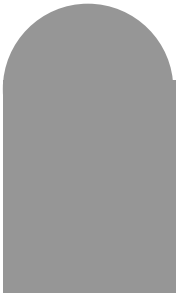
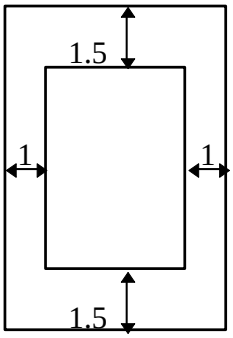
Handout 9: 2.5 Max-Min

1. Your challenge is to create a cylindrical can that minimizes the cost of materials but must hold 100 cubic inches. The top and bottom of the can cost \$0.014 per square inch, while the sides cost only \$0.007 per square inch.

2. A Norman window is comprised of a half circle above a rectangle (see figure) is to be built having a perimeter of 20 feet. Find the dimensions to allow the largest amount of sunlight to enter through the window.



3. A rectangular page is to contain 48 square inches of print. The margins at the top and bottom of the page are each 1½ inches. The margins on each side are 1 inch. What should the dimensions of the page be so that the least amount of paper is used?



4. For groups of 80 or more people, a charter bus company determines the rate per person according to the formula $R(n) = 8 - 0.05(n - 80), n \geq 80$, where the rate is given in dollars and n is the number of people.
a. State in words the rate for groups of 80 or more for the charter bus company.
b. Write the revenue equation for the charter company as a function of *n*.
c. Determine the number of people per group that will produce the maximum revenue for the company.

5. Sue likes to walk in the desert. She walks at 2 miles per hour in the desert, and at 4 miles per hour on roads. She wants to get to the parking lot as quickly as possible when she is 1 mile from the road and the parking lot is 2 miles down the road, as pictured. Rather than walking straight toward her car, or straight toward the road, she will walk at an angle toward the road so she can spend more time walking on the road which is faster. Where should she aim to get to her car the quickest?