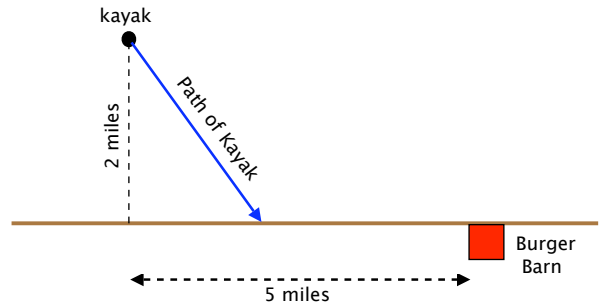
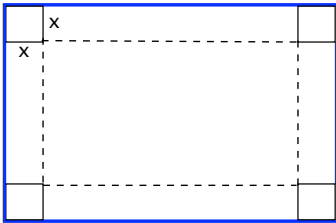


## Optimization Problems

1. Find two numbers whose difference is 250 and whose product is minimum.
2. Suppose we want to make an open-topped box from an  $8.5'' \times 11''$  sheet of paper by cutting congruent squares from the corners and folding up the sides. What is the largest possible volume of such a box?
3. You are kayaking and suddenly feel hungry. You are 2 miles from the nearest point on a straight shoreline and from this nearest point, it is 5 miles to Burger Barn. You know that you can paddle 2 mph and walk 4 mph. If you paddle in a straight line to the shore, where should you land to eat as soon as possible?



### Method for Solving Optimization Problems:

1. Understand the problem. (Unknowns? Given quantities?)
2. Draw a diagram.
3. Assign variables.
4. Write an equation for the quantity  $Q$  that you want to optimize.
5. Use the information in the problem to write  $Q$  in terms of just one variable.
6. Use methods from sections 4.1 and 4.3 to find the extreme values.