1. The sum of two numbers is 20. If one number is x, then the other number is _____.
   Their product is $p(x) = $ _____. Find the maximum value of p.

2. The difference of two numbers is 8. If the smaller number is x, then the other number is
   _____. Their product is $p(x) = $ _____. Find the minimum
   value of p.

3. The sum of two numbers is 40. Find their greatest possible product.

4. Find two numbers such that their sum is 20 and the sum of their squares is as small as
   possible.

5. A rectangle has a perimeter of 100 cm. Find the greatest possible area for the rectangle.

6. A rectangular pen is made with 100 m of fencing on three sides. The fourth side is a
   stone wall. Find the greatest possible enclosure of such an area.

7. There are currently 20 members in a school's Ski Club and the dues are $8 per member.
   To encourage the recruiting of new members, the club treasurer suggests that for each
   new member recruited, the dues for *all* members be reduced by 10 cents.

   a. How much membership money will the club have if it recruits 10 new members?
      15 new members: n new members?

   b. For what value of n will the club's total membership money be a maximum?

8. In Problem #7, suppose that the Ski Club has 24 members instead of 20. How many new
   members should be recruited in order to maximize the total membership money? What
   will this total be?

9. A charter company will provide a plane for a fare of $60 each for 20 or fewer
   passengers. For each passenger in excess of 20, the fare is decreased $2 per person for
   everyone. What number of passengers will produce the greatest revenue for the
   company?

10. A ferry service transporting passengers to an island charges a fare of $10 and carries 300
    persons per day. The managers estimate that the company will lose 15 passengers for
    each increase of $1 in the fare. Find the fare that yields the greatest income.