1.  You want to construct a rectangular playground area in your yard.  You have 500 ft of fencing.

A).  Write a quadratic function to represent the playground area.

   Quadratic Function:  $A(x) = -1w^2 + 250w$
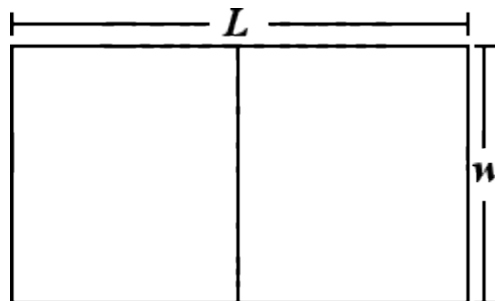
B).  What is the maximum area of the playground?

   Maximum Area:  $15625 \text{ ft}^2$

C).  What are the dimensions of the largest yard?

   Dimensions:  Length = 125 ft  and Width = 125 ft

2.  A farmer needs to create a rectangular area, split into 2 separate rectangular  enclosures, as shown in the diagram.



A).  Write a quadratic function to represent the enclosure, if the farmer has 1200 ft of fencing.

   Quadratic Function:  $A(x) = -1.5w^2 + 600w$

B).    What is the maximum area of the rectangular enclosure?

Maximum Area:  60 000 ft$^2$

C).   What is the domain and range?

Domain:  $0 < w < 400$, $x \in R$          Range:  $0 < A \leq 60\ 000$, $A \in R$

3.  A farmer plans to make a rectangular garden. One side will be against a long barn. He has 100 ft of fencing that he will use to surround the other three sides. What are the dimensions of the garden of maximum area?

Quadratic Function:  $A(x) = -2w^2 + 100w$

Dimensions:  Length = 50 ft  and Width = 25 ft

4.  A rancher has 1200 feet of fencing to enclose two adjacent rectangular corrals of equal lengths and widths as shown in the figure below. What is the maximum area that can be enclosed in the fencing?
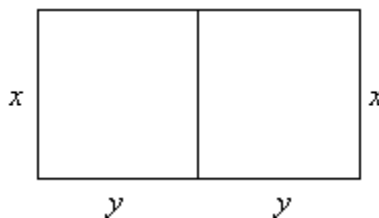


Maximum Area:  90 000 ft$^2$

5.  Calculators are sold to students for 20 dollars each. Three hundred students are willing to buy them at that price. For every 5 dollar increase in price, there are 30 fewer students willing to buy the calculator. What selling price will produce the maximum revenue and what will the maximum revenue be?

Maximum Revenue: $7350          Selling Price: $35

6.  You run a canoe-rental business on a small river in Ohio. You currently charge $12 per canoe and average 36 rentals a day. An industry journal says that, for every fifty-cent increase in rental price, the average business can expect to lose two rentals a day. Use this information to attempt to maximize your income. What should you charge?

Maximum Revenue: $441          Selling Price: $10.50

7.  An inquiry shows that 60,000 students will attend a theater play in one week if the ticket price is 40 dollars. Suppose that for every 2.50 dollars added to the ticket price, 2000 fewer students will attend the play.

a)      What ticket price will give the greatest revenue for the week?

b)      What is the approximate maximum possible profit for the week if the theater play spends approximately 1.5 million dollars to have the play showed for one week?

A)  Ticket Price = $57.50

B)   Profit = $2 645 000 – $1 500 000 = $1 145 000