# ***Optimizing Revenue/Income***

A hockey arena seats 1600 people. The cost of a ticket is $10. At this price, every ticket is sold. To increase revenue, the arena management plans to increase ticket prices. They conduct a survey and determine that for 50 cent increase in price, 50 less people will attend.

(a) What is the initial cost of a ticket?
(b) What is the initial number of people attending the game?
(c) What revenue/income does the hockey arena make?

(d) One price increment of $0.50 is made. What is the new ticket price?
(e) How many people attend the game now?
(f) What revenue/income does the hockey arena make?

(g) Two price increments of $0.50 is made. What is the new ticket price?
(h) How many people attend the game now?
(i) What revenue/income does the hockey arena make?

(j) Three price increments of $0.50 is made. What is the new ticket price?
(k) How many people attend the game now?
(l) What revenue/income does the hockey arena make?

Continue this pattern to complete a data table

| Number of price increments | Ticket price | Number of people attending | Revenue/income |
|---|---|---|---|
| 0 | $10 | 1600 | |
| 1 | | | |
| | | | |
| | | | |

We will ultimately graph “number of increments” vs “revenue”

Finally, what ticket price will maximize revenue?

# ***Optimizing Area/Perimeter***

Work on the Bulletin Board on the back wall. You will need a sheet of graph paper and 4 pins/thumb tacks for these activities. You need to "fence off" a field whose perimeter measures 90 units. You will use the 4 pins/thumb tacks to represent the "corner posts" of the field that you set up.

For example, one possibility is a field that has a width of 5 units and a length of 40 units.

1. So, on the grid paper, put in one "corner post" on one corner of the grid paper.

2. Place the second corner post 5 units "down" from your first corner post.

3. Place the third "corner post" 40 units "across" from your first corner post.

4. Intuition will dictate where the $4^{th}$ one goes!

5. So there you have modeled ONE possible arrangement ➔ a width of 5 units and a length of 40 units. Now determine the area of the field

6. You now have one data point to record ➔ the width vs the area of the field (5 units, 200 units$^2$)

Repeat for another possible width and length ➔ build the model, determine the various measurements and finally the data point

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Etc….

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Width (units) | | | | | | | | | |
| Area (units$^2$) | | | | | | | | | |

We will ultimately graph "width" vs "area"

Finally, what width will maximize area?