Name_____ Algebra 2 **Introduction to Quadratics**

A concert promoter is planning a concert at a small 4000 student campus. If the show takes place, the promoter can expect to pay the band $6000 and also must rent a theater for $1500. The promoter did some market research, asking 80 people this question: "Would you be willing to pay $_____ for a ticket to this concert?" (Note: Even though only 80 people were asked, more than 80 people might attend the concert. The promoter is using the market research to help guide his decisions.)

Complete the table:

| Ticket Price ($) | 2 | 4 | 6 | 8 | 10 | 12 | 14 |
|---|---|---|---|---|---|---|---|
| # of people out of 80 who would be willing to pay this price | 70 | 60 | 50 | 40 | 30 | 20 | 10 |
| # of people out of 4000 who would be willing to pay this price | | | | | | | |
| Income (Ticket price x # buyers) | | | | | | | |

Make a graph of the (ticket price, income) data. (The first and last rows from the table.)

Also, draw a horizontal line across your graph showing the expenses ($7500.)

Find answers to the following questions. Explain/show how you got your answers.

Use your graph to answer the following questions:

a. For what ticket price or prices will the promoter break even?

b. What ticket price or prices will lead to maximum **income?**

c. What will the maximum **income** be?

3. Copy your data from your table above.

| Ticket Price ($) | 2 | 4 | 6 | 8 | 10 | 12 | 14 |
|---|---|---|---|---|---|---|---|
| # of people out of 4000 who would be willing to pay this price | | | | | | | |

4.a. What type of relationship is this?

b. Write an equation to model the situation: Let x = ticket price, y = # tickets sold

5. Now you will find an equation for the income. (Income = ticket price x # tickets sold.) Complete the following:

a. Suppose 50 tickets are sold @ $8.00 per ticket. **What is the income?** Show work:

b. Suppose 110 tickets are sold @ $6.00 per ticket. **What is the income?** Show work:

c. Suppose 87 tickets are sold @ $12.00 per ticket. **What is the income?** Show work:

d. Suppose _____ tickets are sold @ "x" dollars per ticket. **What is the income?**
Put your equation from problem 4b here.
(Write your answer in factored form and in expanded form.)

6. Remember how the promoter had to pay $6000 for the band and $1500 for the theater? Profit is calculated by subtracting expenses from income. Complete the following:

a. If income is $8600. **What is the profit?** Show work:

b. If income is $2,400. **What is the profit?** Show work:

c. If income is $16,040. **What is the profit?** Show work:

d. If income is_____. What is the profit?
Put your equation from problem 5d here.
(Write your answer in factored form and in expanded form.)

e. Use the Y= button on your calculator. Input the profit equation. Use tables to answer the following questions. Show a portion of the table to verify your answer.

i. For what ticket price or prices will the promoter break even?

ii. What ticket price will provide the maximum **profit?**