**Using Quadratic Functions to Understand Business Models**

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

A school drama club wants to put on a production of one of their favorite plays. They did some research and found that the relationship between the number of tickets that they could sell (s) and the price of each ticket (x) in dollars can be found by using the equation s=1000-125x.

There are some expenses that the drama club has to consider. They have to pay to advertise for the play and they have to pay for costumes and props. The total cost of expenses ended up totaling $750.

1. Write a function that can be used to predict income I for a ticket price x.
2. Write a function that can be used to predict profit P for any ticket price x.
3. How do the income and profit change as the ticket price increases from $0 to $10?
4. What ticket prices would result in the drama club losing money?
5. What ticket prices would result in the drama club having a positive profit?
6. What ticket price will provide the highest profit? What is the maximum profit?
7. What ticket price will provide the highest income? What is the maximum income?
8. What is the relationship between the maximum income and the maximum profit?
9. How much does each ticket need to cost in order for the drama club to break even (this is when the drama club only makes enough to pay for the expenses, so the income would equal expenses)?

Independent Practice

Below is a table that represents the relationship between daily profit, P for an amusement park and the number of paying visitors in thousands, n.

|  |  |
| --- | --- |
| n | P |
| 0 | 0 |
| 1 | 5 |
| 2 | 8 |
| 3 | 9 |
| 4 | 8 |
| 5 | 5 |
| 6 | 0 |

1. What are the x-intercepts and y-intercepts and explain them in the context of the problem.
2. Identify any maximums or minimums and explain their meaning in the context of the problem.
3. Determine if the graph is symmetrical and what type of function best models this pattern of change.
4. Describe the intervals of increase and decrease and explain them in the context of the problem.