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Applications of Quadratic Functions Word Problems

Part A: Revenue and Numeric Problems

When you solve problems using equations, your solution must have four components:

1. A let statement, table or diagram where you define the variables used to solve the problem.
2. The equations which model the problem.
3. The algebraic solving, showing all steps which you cannot perform in your head
4. A closing statement which answers the question posed in the problem.

One of the most important things you must do is read the question carefully and look for the key words.

Part 1: Revenue Questions

Need to know: ***Revenue = (number of items sold) x (price of per item)***

1. The current price of an amateur theater tickets is \$20, and the venue typically sells 500 tickets. A survey found that for each \$1 increase in ticket price, 10 fewer tickets are sold.
 - (a) What is the number of \$1 increases in price that will maximize the revenue?
 - (b) What price per ticket will maximize the revenue?
 - (c) What is the maximum revenue?

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2. A sticker warehouse sells an average of 6 rolls of stickers per customer at \$4 per roll. Statistics show that for every \$0.25 decrease in price, customers will buy an additional roll.
 - (a) According to this model, if the stickers were reduced to \$3 per roll, what will be the revenue?
 - (b) According to this model, at what sticker price will the revenue from stickers be \$28.

3. NTCI team photos sell for \$10 each, and the coaches find that they sell on average 30 photographs per team. The coaches do a survey and find out that for each reduction in price of \$0.50, an additional two photographs will be sold.
 - (a) At what price will the revenue from the photographs be \$150?
 - (b) At what price will the revenue be a maximum?

Additional Questions

7. The Lazy Boys are planning to have a concert during the Thanksgiving weekend. If the ticket is set to be \$75 each, then 1800 tickets will be sold. For each \$1 increase in the ticket price, 20 fewer tickets are sold. What should be the price of each ticket to maximum revenue, and what will be the maximum revenue?
8. A sporting goods store sells 90 ski jackets in a season for \$200 each. Each \$10 decrease in the price would result in five more jackets being sold. Find the number of jackets sold and the selling price to give revenues of \$17 600 from sales of ski jackets.
9. The product of two consecutive numbers is 3306. What are the numbers?
10. Two numbers sum to 10. What are the numbers if their product is a maximum?