

Application of Quadratic Functions

Learning Objectives

- Use quadratic functions in break-even and profit-loss analysis
-

Use quadratic functions in break-even and profit-loss analysis

1. A particular model of vehicle is priced according to the demand function $p = 25 - 0.001x$, where price is in thousands of dollars, and sales x is in thousands of cars. The cost to build the car is 20,000 per car, with a fixed cost of \$2,000,000. Use the same units as the demand function and write an equation for the cost, then use that information to find a profit function.

2. Use the equation you found to find the break-even point. Round your answer to the nearest whole car.

3. What is the largest number of cars that can be sold before the company starts losing money? Round your answer to the nearest whole car.

- Profit = Revenue – Cost
- Revenue = Quantity Sold * Price
- Cost = Cost per Unit * Number of Units + Fixed Costs
- Break-even Point: Profit = 0 or Revenue = Cost; if you get a decimal answer, round up!

ANSWER KEY

1. $C(x) = 20x + 2000, R(x) = 25x - 0.001x^2, P(x) = -0.001x^2 + 5x - 2000$
2. 438,447 cars
3. 4,561,552 cars