Chapter 15B Question

The demand function for football tickets for a typical game at a large midwestern university is \( D(p) = 200,000 - 10,000p \). The university has a clever and greedy athletic director who sets his ticket prices so as to maximize revenue. The university's football stadium holds 100,000 spectators.

(a) Write down the inverse demand function.

(b) Write an expression for total revenue as a function of the number of tickets sold.

(c) Write an expression for marginal revenue as a function of the number of tickets sold.

(d) Using a solid line, draw the inverse demand function.

(e) Using a dashed line, draw the marginal revenue function.

(f) Using a solid line, draw a vertical line for stadium capacity and label it.

(g) What price will generate the maximum revenue?

(h) What quantity will be sold at the price in part (g)?

(i) At the quantity in part (h), what is marginal revenue?

(j) At the quantity in part (h), what is the price elasticity of demand, \( \varepsilon \)?

(k) Will the stadium be full at the quantity in part (h)?

(l) A series of winning seasons caused the demand curve for football tickets to shift upward. The new demand function is \( D(p) = 300,000 - 10,000p \). What is the new inverse demand function?

(m) Write an expression for marginal revenue as a function of the number of tickets sold.

(n) Using a dotted line, draw the new demand function.

(o) Using pluses, draw the new marginal revenue function.

(p) Ignoring stadium capacity, what price would generate maximum revenue?

(q) What quantity would be sold at the price in part (p)?

(r) The quantity of seats that would maximize total revenue with the new higher demand curve is greater than the capacity of the stadium. Clever though the athletic director is, he cannot sell seats he doesn’t have. He notices that his marginal revenue is positive for any number of seats that he sells up to the capacity of the stadium. Therefore, in order to maximize his revenue, how many tickets should he sell at what price?

(s) What price per ticket should the athletic director charge for the quantity sold in part (r)?

(t) When he uses the quantity from part (r) and the price from part (s), what is his marginal revenue from selling an extra seat?

(u) What is the elasticity of demand for tickets using the quantity from part (r) and the price from part (s)?