

AI1110

Assignment 2

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Outline

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Question 19.c

The average cost function associated with producing and marketing x units of an item is given by $AC = 2x - 11 + \frac{50}{x}$. Find the range of values of the output x , for which AC is increasing.

Solution

The average cost function associated with producing and marketing x units of an item is given as:

$$AC = 2x - 11 + \frac{50}{x}$$

Output for which AC increases is: $\frac{d(AC)}{d(x)} > 0$

$$\implies \frac{d}{dx} \left(2x - 11 + \frac{50}{x} \right) > 0$$

$$\implies (x^2 - 25) > 0$$

$$\implies (x - 5)(x + 5) > 0$$

$$\implies x > 5 \text{ as } (x > 0)$$

\therefore the average cost increases when output $x > 5$.

Answer

In the range of $x \in (5, \infty)$, the average cost function increases.