

Question

If we take that airplane company sold x first class tickets and y economic class tickets, then we will have:

1. Maximum number of passengers is 200, then $x + y \leq 200$.

2. Baggage for the first class ticket is 20 kg, the total mass of the baggage (if the company sold x first class tickets) is: $20x$. And we know that the maximum mass of the baggage is 4500 kg, the we will have: $20x \leq 4500$.

3. Company's profit, which we need to maximize, will be:

$$500x + 300y \rightarrow \max.$$

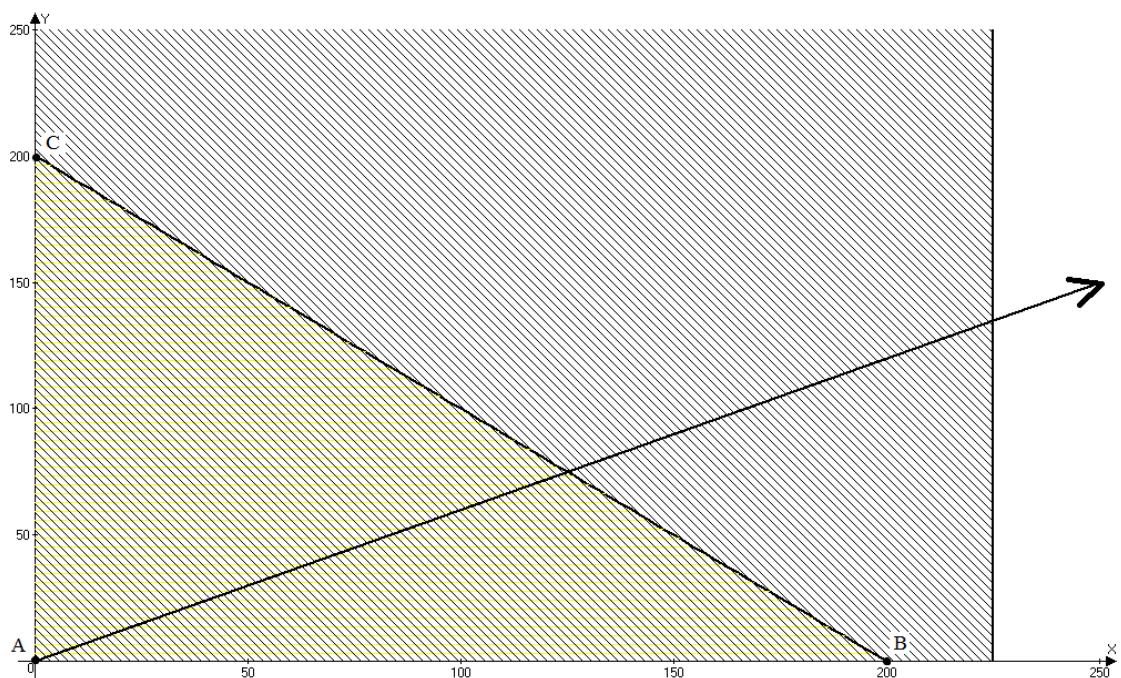
So, we have such maximizing problem:

$$500x + 300y \rightarrow \max$$

$$x + y \leq 200$$

$$20x \leq 4500$$

We can solve it graphically:



We see that maximum point is B, which has coordinates: $B(x, y) = (200, 0)$. It means that the company should sell 200 first class tickets and 0 economic class tickets for maximize its profit. And in this case its profit will be $500 \cdot 200 + 300 \cdot 0 = \100000 .

Answer: company should sell 200 first class tickets and 0 economic class tickets to maximize its profit, which in this case will be equal to \$100000.