Sunk cost 2

A group has rented a bus to go to New York. The driver costs 100$, the bus 500$, and the toll 75$. The driver's fee cannot be recovered, but the bus can be canceled a week in advance by paying only 50$. If the ticket costs 18$, how many people need to buy tickets so that the trip does not have to be canceled?

- The driver costs 100$.
- The bus costs 500$.
- The toll costs 75$.

The bus can be canceled one week in advance by paying 50$. The driver's fee is non-refundable. If the ticket price is 18$, how many people must buy tickets to avoid canceling the trip?

Solution

Since the driver's fee cannot be recovered, it is considered a sunk cost and should not be taken into account when making the decision. The sum of costs if the trip is taken is:

$$500 + 75 = 575$$

On the other hand, if the trip is canceled:

$$50$$

Therefore, for the trip to be profitable, the following condition must be met:

$$18 \cdot P - 575 \geq -50$$

This means that the profit from the trip minus its cost must be greater than the cost of canceling the trip and only paying 50 for the bus cancellation fee. Solving for P:

$$P \geq 29.17$$

Using whole numbers:

$$P \geq 30$$

Therefore, more than 30 people are needed for the trip to be profitable and not canceled.