Problem 36

There are 60 people in my class. No two students receive the same grade; the average grade of students below first quartile is 40%; the average grade of students above the third quartile is 90%; and the total class average is 70%. What is the average of the middle 50% of the class?

Answer

75%

Explanation

Since no two students get the same grade. $Q1$ and $Q3$ must lie strictly between the $15^{\text{th}} and 16^{\text{th}}$ and $45^{\text{th}} and 46^{\text{th}}$ student respectively.

Thus there are exactly 15 people in the lower and upper 25% of the population. Thus, taking the weighted mean, we have:

$$\bar{X} = \frac{15(40\%) + 30(x) + 15(90\%)}{60} = 70\% \Rightarrow x = 75\%$$