

Answer on Question #44748 – Math - Statistics and Probability

The table below shows the distribution of scores in a Statistics test given to a class of 40 students. The teacher decided to pass the upper 40% of these students

Class Limits	f
91-97	2
84-90	3
77-83	7
70-76	15
63-69	6
56-62	4
49-55	3

1. What is the passing score?
2. What is the percentile rank of the student whose score is 80?

Solution

1. The passing score is 40th percentile.

kth percentile is

$$\text{kth percentile} = L + \frac{\frac{kN}{100} - cf}{f} \cdot w$$

where L is lower limit of P_k class, f is frequency of P_k class, cf is cumulative frequency of the class just preceding P_k class, w is size of P_k class, N is total numbers of items.

In this example (40th percentile class is 70-76):

$$L = 70, f = 15, N = 40, cf = 12, w = 7.$$

$$40\text{th percentile} = 70 + \frac{\frac{40 \cdot 40}{100} - 12}{15} \cdot 7 = 71.87.$$

2. What is the percentile rank of the student whose score is 80?

$$80 = 77 + \frac{\frac{k \cdot 40}{100} - 5}{7} \cdot 7 \rightarrow k = 20.$$