Percentiles and cumulative frequencies

6 questions | 12 marks

Equivalent correct methods earn the corresponding marks.

1. Frequencies are 3, 7, 4, 6. Write the cumulative frequencies. [2 marks]

Start with 3.

Add each next frequency to the running total.

Answer: 3, 10, 14, 20.

2. Cumulative frequencies are 4, 11, 19, 25. Find the original frequencies. [2 marks]

First frequency 4.

Successive differences: $11-4,\ 19-11,\ 25-19$.

Answer: 4, 7, 8, 6.

3. For ordered values 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, find P_{80} by nearest rank. [2 marks]

$\lceil 0.8\times 10\rceil = 8$.

The eighth value is 16.

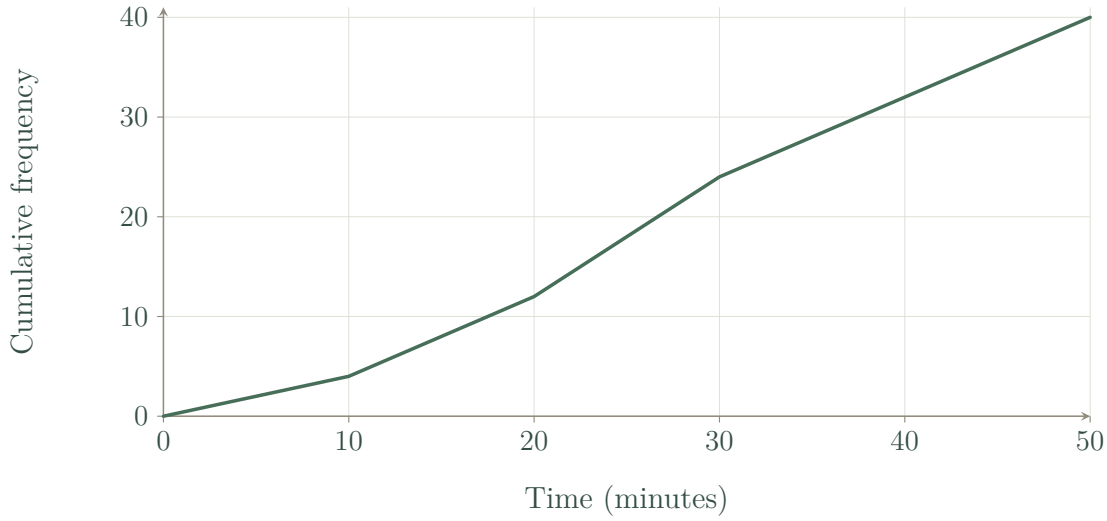
Answer: 16

4. A sample has 60 values. Which rank gives P_{25} under nearest rank? [2 marks]

$\lceil 0.25\times 60\rceil = 15$.

Answer: 15th

5. Use the graph to estimate P_{80} for 40 times. [2 marks]



$0.80 \times 40 = 32$.

Cumulative 32 corresponds to 40 minutes.

Answer: 40 minutes

6. A graph puts P_{90} at 45 minutes. Explain this in context. [2 marks]

A percentile locates an ordered position.

It does not give the probability that every future task finishes by 45 minutes.

Answer: About 90% of recorded completion times are 45 minutes or less.