Worked answers | Statistics and data analysis

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 P80 by nearest rank. [2 marks]

ceil(0.8×10)=8.

The eighth value is 16.

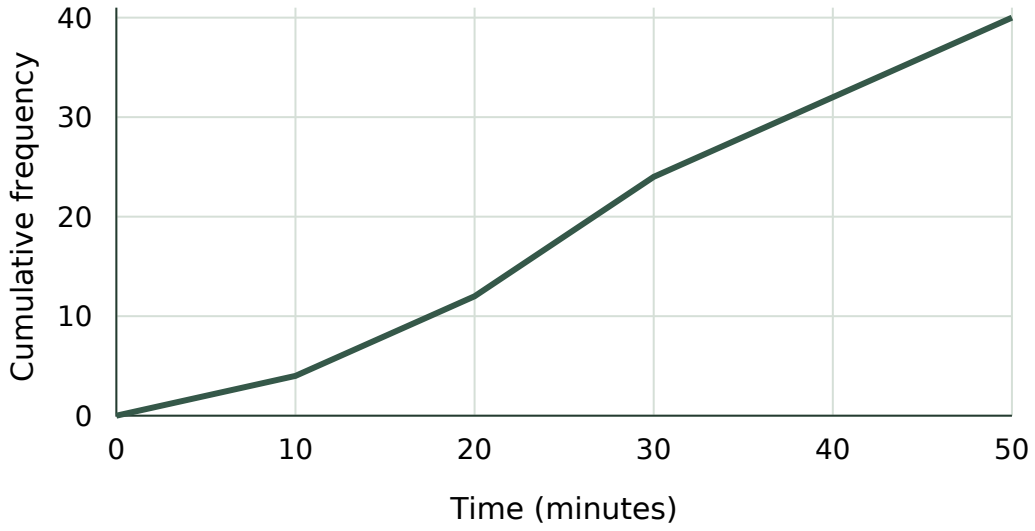
Answer: 16

4. A sample has 60 values. Which rank gives P25 under nearest rank? [2 marks]

ceil(0.25×60)=15.

Answer: 15th

5. Use the graph to estimate P80 for 40 times. [2 marks]



0.80×40=32.

Cumulative 32 corresponds to 40 minutes.

Answer: 40 minutes

6. A graph puts P90 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.