IGCSE - Estimated Mean and Cumulative Frequency - 1

9 Oct 05 Paper 4

Answer the whole of this question on one sheet of graph paper.

The heights (h cm) of 270 students in a school are measured and the results are shown in the table.

h	Frequency
$120 < h \leqslant 130$	15
$130 < h \leqslant 140$	24
$140 < h \leqslant 150$	36
$150 < h \leqslant 160$	45
$160 < h \leqslant 170$	50
$170 < h \leqslant 180$	43
$180 < h \leqslant 190$	37
$190 < h \leqslant 200$	20

(a) Write down the modal group. [1]

(b) **(i)** Calculate an estimate of the mean height. [4]

(ii) Explain why the answer to **part (b)(i)** is an estimate. [1]

(c) The following table shows the cumulative frequencies for the heights of the students.

h	Cumulative frequency
$h \leqslant 120$	0
$h \leqslant 130$	p
$h \leqslant 140$	q
$h \leqslant 150$	r
$h \leqslant 160$	120
$h \leqslant 170$	170
$h \leqslant 180$	213
$h \leqslant 190$	250
$h \leqslant 200$	270

Write down the values of p, q and r. [2]

(d) Using a scale of 1cm to 5 units, draw a horizontal h-axis, starting at $h = 120$.
Using a scale of 1cm to 20 units on the vertical axis, draw a cumulative frequency diagram. [5]

(e) Use your diagram to find

(i) the median height, [1]

(ii) the upper quartile, [1]

(iii) the inter-quartile range, [1]

(iv) the 60th percentile. [1]

(f) All the players in the school's basketball team are chosen from the 30 tallest students.
Use your diagram to find the least possible height of any player in the basketball team. [2]