HIGHER

6.11 Cumulative Frequency: 10-minute Pack

Total Marks

EDEXCEL 1MA1 · Calculator allowed · about 10 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A charity organises a fun run. The times, t minutes, taken by 60 runners to complete the course are recorded below.

Time, t (minutes)	Frequency
$30 < t \leq 40$	4
$40 < t \leq 50$	9
$50 < t \leq 60$	15
$60 < t \leq 70$	18
$70 < t \leq 80$	10
$80 < t \leq 90$	4

(a) Complete the cumulative frequency table below. Some values have already been filled in for you. **(2)**

Time, t (minutes)	Cumulative frequency
$t \leq 40$	4
$t \leq 50$	13
$t \leq 60$	...
$t \leq 70$	46
$t \leq 80$	...
$t \leq 90$	60

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(b) Write down the coordinates you would plot on a cumulative frequency graph to represent (i) the class $40 < t \leq 50$, and (ii) the class $80 < t \leq 90$. **(2)**

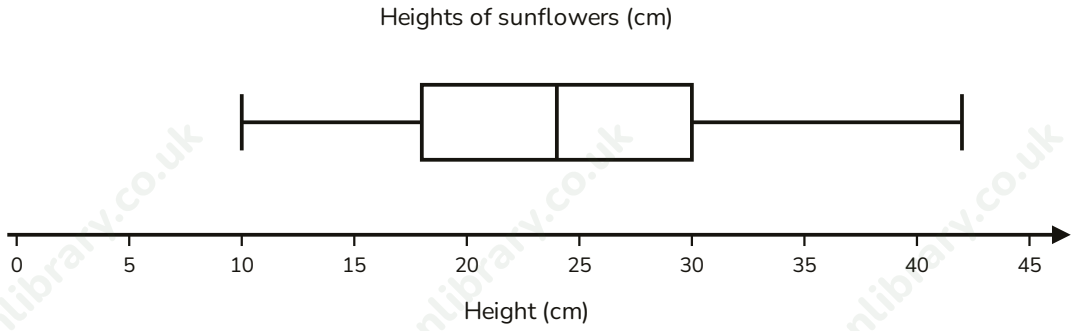
.....

(Total for Question 1 is 4 marks)

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2 The box plot below shows the heights, in cm, of a sample of sunflowers grown in a greenhouse.

Minimum = 10 cm, Lower quartile = 18 cm, Median = 24 cm, Upper quartile = 30 cm, Maximum = 42 cm



(a) Find the range of the sunflower heights. **(1)**

.....

(b) Find the interquartile range of the sunflower heights. **(1)**

.....

(Total for Question 2 is 2 marks)

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3 A set of exam marks has minimum 22, lower quartile 48, median 61, upper quartile 77 and maximum 95.

(a) Write down the interquartile range. **(1)**

.....

(b) Write down the range. **(1)**

.....

(c) The range will always be greater than or equal to the interquartile range for any data set. Explain why. **(1)**

.....

.....

.....

.....

(Total for Question 3 is 3 marks)

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Mark scheme · 6.11 Cumulative Frequency: 10-minute Pack

Question 1

(a) $t \leq 60$: 28 cao **B1**

(a) $t \leq 80$: 56 cao **B1**

(a) Answer: 28 and 56

(b) using the upper class boundary and the cumulative frequency oe **M1**

(b) (50, 13) and (90, 60) cao **A1**

(b) Answer: (50, 13) and (90, 60)

Question 2

(a) 32 cm cao **B1**

(a) Answer: 32 cm

(b) 12 cm cao **B1**

(b) Answer: 12 cm

Question 3

(a) 29 cao **B1**

(a) Answer: 29

(b) 73 cao **B1**

(b) Answer: 73

(c) oe: the IQR only measures the spread of the middle 50% of the data, so it excludes the most extreme values, which can only make the range bigger (or equal), never smaller **B1**

(c) Answer: The IQR measures the spread of only the middle 50% of the data, excluding the most extreme values, so it can never be more than the full range from minimum to maximum.

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