HIGHER ONLY
HIGHER TIER

Name ..... Class .....

S3: Histograms and cumulative frequency

Histograms with equal and unequal class widths; cumulative frequency graphs

20 marks · 25 minutes · Calculator allowed

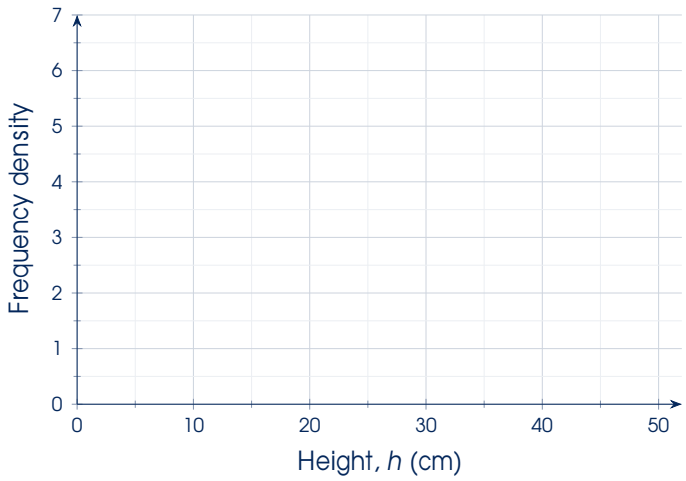
1) The table shows the heights of some plants.

Height, h (cm)	Frequency	Frequency density
$0 < h \leqslant 10$	10	
$10 < h \leqslant 15$	20	
$15 < h \leqslant 20$	30	
$20 < h \leqslant 30$	24	
$30 < h \leqslant 50$	16	

(a) Complete the frequency density column.

(2)

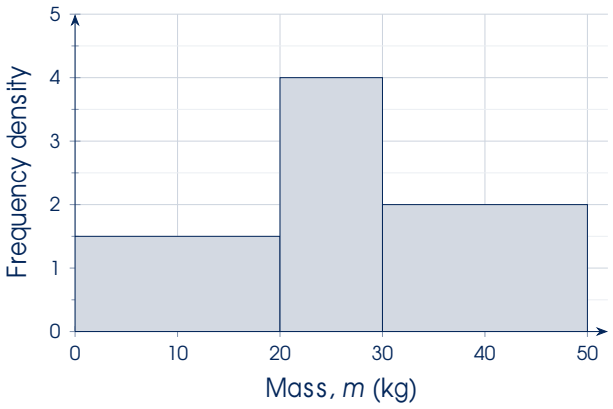
(b) Draw a histogram for the data.



(3)

[Question 1: 5 marks]

2) The histogram shows the masses of some parcels.



(a) How many parcels had a mass from 0 kg to 20 kg?

.....

(1)

(b) How many parcels had a mass from 20 kg to 30 kg?

.....

(1)

(c) How many parcels had a mass from 30 kg to 50 kg?

.....

(1)

(d) How many parcels were there altogether?

.....

(1)

[Question 2: 4 marks]

3) A histogram bar for the class $15 < x \leqslant 25$ represents a frequency of 30. Find its frequency density.

.....

[Question 3: 1 marks]

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4) In a histogram, what does the area of each bar represent?

.....

[Question 4: 1 marks]

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5) The table shows the times 50 people took to finish a puzzle.

Time, t (min)	Frequency	Cumulative frequency
$0 < t \leqslant 10$	4	
$10 < t \leqslant 20$	10	
$20 < t \leqslant 30$	18	
$30 < t \leqslant 40$	12	
$40 < t \leqslant 50$	6	

(a) Complete the cumulative frequency column.

(2)

(b) Write down the class that contains the median.

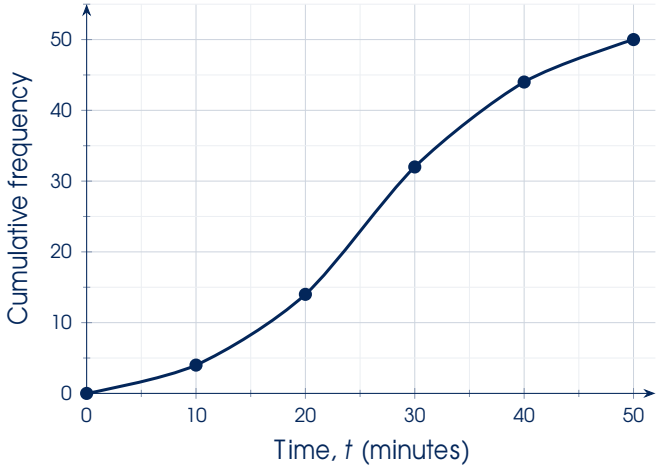
.....

(1)

[Question 5: 3 marks]

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6) Here is the cumulative frequency graph for the data in question 5.



(a) Estimate the median.

..... minutes

(1)

(b) Estimate the interquartile range.

..... minutes

(2)

(c) Estimate how many people took more than 45 minutes.

.....

(1)

(d) How many people took 30 minutes or less?

.....

(1)

[Question 6: 5 marks]

7) Which diagram is suitable for continuous data with unequal class widths?

.....

[Question 7: 1 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	(a) 1, 4, 6, 2.4, 0.8 (b) histogram	(a) B2 (B1 for 3 or 4 correct). (b) Correct widths (B1); correct heights (B2, B1 for 3 or 4).
2	(a) 30 (b) 40 (c) 40 (d) 110	B1 each.
3	3	B1.
4	Frequency	B1.
5	(a) 4, 14, 32, 44, 50 (b) $20 < t \leqslant 30$	(a) B2 (B1 for 3 correct). (b) B1.
6	(a) about 26 (b) about 16 (c) about 3 (d) 32	(a) 25 to 27 (B1). (b) LQ about 18.5 and UQ about 34.5 (M1); 14 to 18 (A1). (c) 2 to 4 (B1). (d) B1.
7	histogram	B1.