HIGHER

7.16 Histograms: 30-minute Pack

EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

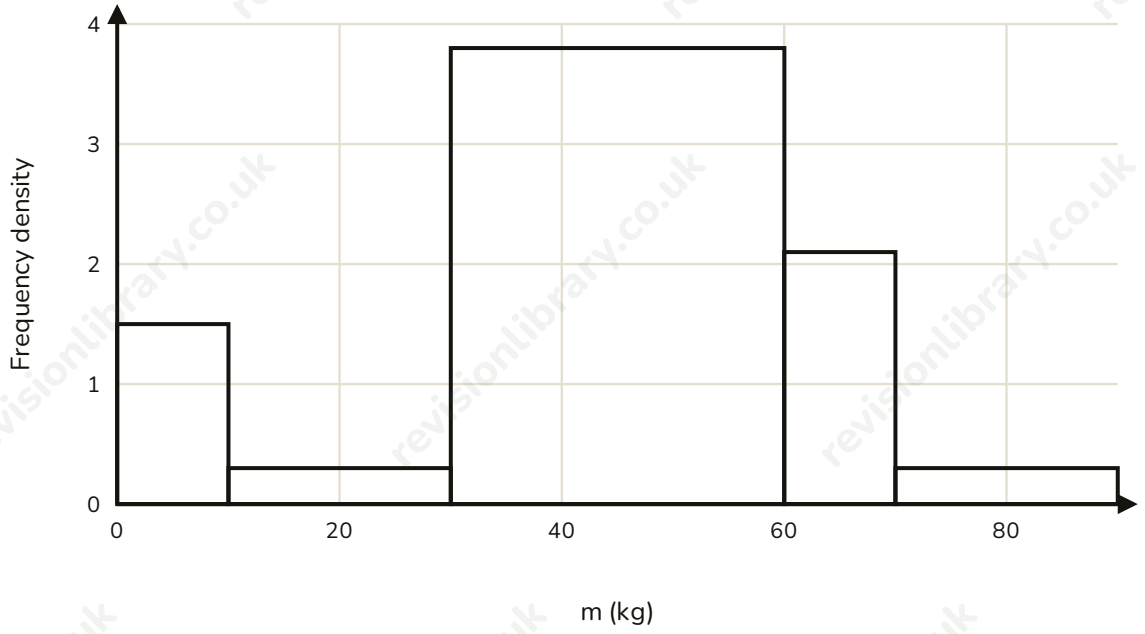
Answer ALL questions. Show all your working.

1 The table shows the mass (m kg) of some items, with the frequency for each class. $0 < m \leq 15$: 12; $15 < m \leq 25$: 14; $25 < m \leq 45$: 32; $45 < m \leq 60$: 12. Work out the frequency density for each class. Give the frequency densities in order, separated by commas.

(Total for Question 1 is 2 marks)

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2 A histogram shows the mass (m kg) of some items. The heights of the bars (frequency densities) are: $0 < m \leq 10$: bar height 1.5; $10 < m \leq 30$: bar height 0.3; $30 < m \leq 60$: bar height 3.8; $60 < m \leq 70$: bar height 2.1; $70 < m \leq 90$: bar height 0.3. Work out an estimate for the mean mass. Give your answer correct to 1 decimal place.



(Total for Question 2 is 4 marks)

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3 A histogram shows the height (h cm) of some items. The bar for the class width 5 has a frequency of 6. Another bar has class width 15 and is 0.5 times as tall as that bar. Work out the frequency for the class of width 15.

(Total for Question 3 is 3 marks)

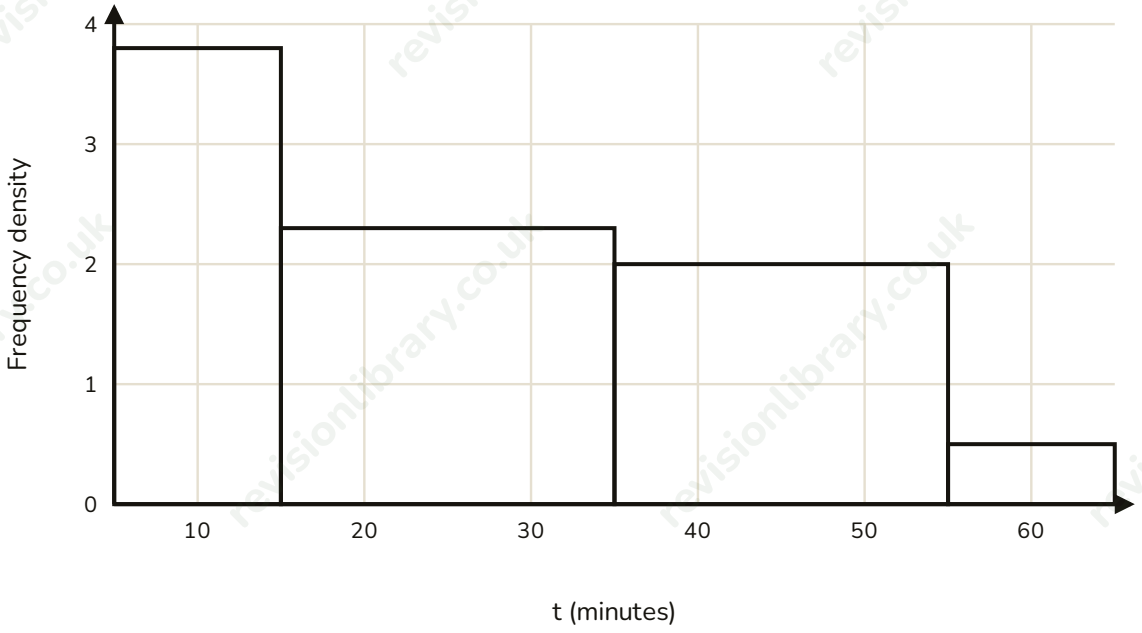
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4 The table shows the height (h cm) of some items, with the frequency for each class. $5 < h \leq 25$: 36; $25 < h \leq 30$: 4; $30 < h \leq 50$: 76; $50 < h \leq 60$: 19; $60 < h \leq 70$: 31. Work out the frequency density for each class. Give the frequency densities in order, separated by commas.

(Total for Question 4 is 2 marks)

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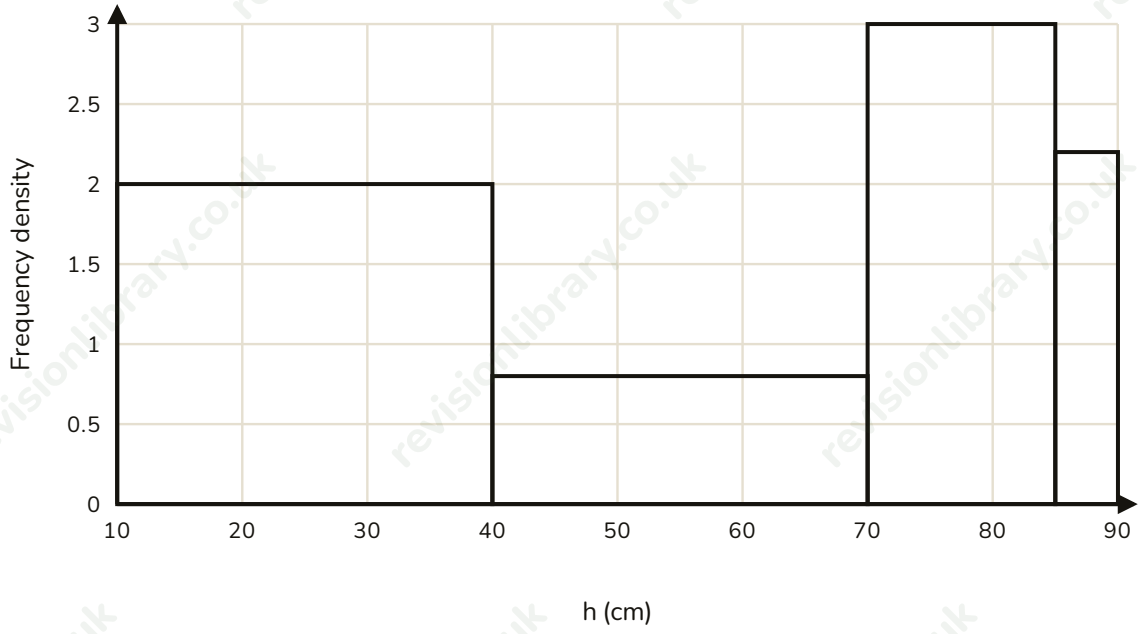
5 A histogram shows the time (t minutes) of some items. The heights of the bars (frequency densities) are: $5 < t \leq 15$: bar height 3.8; $15 < t \leq 35$: bar height 2.3; $35 < t \leq 55$: bar height 2; $55 < t \leq 65$: bar height 0.5. Work out an estimate for the mean time. Give your answer correct to 1 decimal place.



(Total for Question 5 is 4 marks)

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6 A histogram shows the height (h cm) of some items. The heights of the bars (frequency densities) are: $10 < h \leq 40$: bar height 2; $40 < h \leq 70$: bar height 0.8; $70 < h \leq 85$: bar height 3; $85 < h \leq 90$: bar height 2.2. Work out an estimate for the number of items with h greater than 68.



(Total for Question 6 is 4 marks)

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7 The table shows the mass (m kg) of some items, with the frequency for each class. $10 < m \leq 20$: 19; $20 < m \leq 30$: 25; $30 < m \leq 40$: 11; $40 < m \leq 50$: 19; $50 < m \leq 70$: 40. Work out the frequency density for each class. Give the frequency densities in order, separated by commas.

(Total for Question 7 is 2 marks)

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8 A histogram has classes:
0-10 density 1 (frequency 10),
10-30 density 2 (frequency 40),
30-? density 3 (frequency unknown).
The total number of observations is 80.
Find the upper boundary of the last class.

(Total for Question 8 is 3 marks)

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Mark scheme · 7.16 Histograms: 30-minute Pack

Question 1

frequency density = frequency / class width	**M1**
0.8, 1.4, 1.6, 0.8 all correct	**A1**

Answer: 0.8, 1.4, 1.6, 0.8

Question 2

frequencies found using frequency density x width	**M1**
midpoints used	**M1**
sum of frequency x midpoint divided by total frequency	**M1**
44.3 kg cao	**A1**

Answer: 44.3 kg

Question 3

frequency density of first bar = 6/5	**M1**
frequency density of second bar = 0.5 x 6/5	**M1**
9 cao	**A1**

Answer: 9

Question 4

frequency density = frequency / class width	**M1**
1.8, 0.8, 3.8, 1.9, 3.1 all correct	**A1**

Answer: 1.8, 0.8, 3.8, 1.9, 3.1

Question 5

frequencies found using frequency density x width	**M1**
midpoints used	**M1**
sum of frequency x midpoint divided by total frequency	**M1**
28.1 minutes cao	**A1**

Answer: 28.1 minutes

Question 6

fd x (70 - 68) for the class containing 68	**M1**
frequencies of the later classes found	**M1**
adds all the parts	**M1**
57.6 cao	**A1**

Answer: 57.6

Question 7

frequency density = frequency / class width	**M1**
1.9, 2.5, 1.1, 1.9, 2 all correct	**A1**

Answer: 1.9, 2.5, 1.1, 1.9, 2

Question 8

set up equation: 10 + 40 + 3w = 80, where w is the width of the last class	**M1**
solve 3w = 30 so w = 10	**M1**
upper boundary = 30 + 10 = 40 cao	**A1**

Answer: 40 (the last class is 30-40 because width w = 10).

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