3.11 Estimated Mean from Grouped Data: 1-hour Pack

EDEXCEL 1ST0 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 The table shows the amount, in pounds, spent in a shop.

Class (pounds)	Frequency
$0 < x \leq 5$	6
$5 < x \leq 10$	10
$10 < x \leq 15$	18
$15 < x \leq 20$	7
$20 < x \leq 25$	3
$25 < x \leq 30$	4

A frequency polygon is to be drawn from this table.

(a) Write down the coordinates of the point plotted for the class $25 < x \leq 30$.

(b) Work out the total frequency.

(c) Write down the modal class.

(Total for Question 1 is 4 marks)

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2 The grouped frequency table shows the amount, in pounds, spent at a kiosk for 43 customers.

Amount, p (pounds)	Frequency
$10 < p \leq 30$	2
$30 < p \leq 50$	8
$50 < p \leq 70$	19
$70 < p \leq 90$	6
$90 < p \leq 110$	8

(a) Write down the modal class.

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

(c) Calculate an estimate for the mean. Give your answer to 1 decimal place.

(Total for Question 2 is 6 marks)

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3 The table shows the distance, in kilometres, that employees travel to work.

Class (km)	Frequency
$0 < x \leq 20$	18
$20 < x \leq 40$	12
$40 < x \leq 60$	4
$60 < x \leq 80$	7
$80 < x \leq 100$	12
$100 < x \leq 120$	8

A frequency polygon is to be drawn from this table.

(a) Write down the coordinates of the point plotted for the class $20 < x \leq 40$.

(b) Work out the total frequency.

(c) Write down the modal class.

(Total for Question 3 is 4 marks)

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4 The table shows the age, in years, of people at a swimming pool.

Class (years)	Frequency
$0 < x \leq 20$	4
$20 < x \leq 40$	6
$40 < x \leq 60$	15
$60 < x \leq 80$	10
$80 < x \leq 100$	10

A frequency polygon is to be drawn from this table.

(a) Write down the coordinates of the point plotted for the class $60 < x \leq 80$.

(b) Work out the total frequency.

(c) Write down the modal class.

(Total for Question 4 is 4 marks)

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5 The grouped frequency table shows the height, in centimetres, of plants for 56 plants.

Height, h (cm)	Frequency
$0 < h \leq 5$	13
$5 < h \leq 10$	11
$10 < h \leq 15$	4
$15 < h \leq 20$	15
$20 < h \leq 25$	13

(a) Write down the modal class.

(b) Calculate an estimate for the mean. Give your answer to 1 decimal place.

(Total for Question 5 is 4 marks)

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6 The table shows the amount, in pounds, spent in a shop.

Class (pounds)	Frequency
$10 < x \leq 20$	6
$20 < x \leq 30$	6
$30 < x \leq 40$	7
$40 < x \leq 50$	8
$50 < x \leq 60$	10
$60 < x \leq 70$	15

A frequency polygon is to be drawn from this table.

(a) Write down the coordinates of the point plotted for the class $50 < x \leq 60$.

(b) Work out the total frequency.

(c) Write down the modal class.

(Total for Question 6 is 4 marks)

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7 The table shows the distance, in kilometres, that employees travel to work.

Class (km)	Frequency
$0 < x \leq 10$	9
$10 < x \leq 20$	11
$20 < x \leq 30$	7
$30 < x \leq 40$	16
$40 < x \leq 50$	17
$50 < x \leq 60$	5

A frequency polygon is to be drawn from this table.

(a) Write down the coordinates of the point plotted for the class $0 < x \leq 10$.

(b) Work out the total frequency.

(c) Write down the modal class.

(Total for Question 7 is 4 marks)

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8 The grouped frequency table shows the time, in minutes, spent on homework for 52 students.

Time, t (minutes)	Frequency
$10 < t \leq 20$	9
$20 < t \leq 30$	17
$30 < t \leq 40$	14
$40 < t \leq 50$	6
$50 < t \leq 60$	6

(a) Write down the modal class.

(b) Calculate an estimate for the mean. Give your answer to 1 decimal place.

(Total for Question 8 is 4 marks)

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9 The table shows the amount, in pounds, spent in a shop.

Class (pounds)	Frequency
$0 < x \leq 20$	6
$20 < x \leq 40$	12
$40 < x \leq 60$	9
$60 < x \leq 80$	3

A frequency polygon is to be drawn from this table.

(a) Write down the coordinates of the point plotted for the class $40 < x \leq 60$.

(b) Work out the total frequency.

(c) Write down the modal class.

(Total for Question 9 is 4 marks)

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10 The grouped frequency table shows the height, in centimetres, of plants for 67 plants.

Height, h (cm)	Frequency
$10 < h \leq 15$	18
$15 < h \leq 20$	7
$20 < h \leq 25$	12
$25 < h \leq 30$	10
$30 < h \leq 35$	20

(a) Write down the class interval that contains the median.

(b) Calculate an estimate for the mean. Give your answer to 1 decimal place.

(c) The mean is only an estimate. Explain why.

(Total for Question 10 is 6 marks)

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11 The table shows the distance, in kilometres, that employees travel to work.

Class (km)	Frequency
$0 < x \leq 5$	9
$5 < x \leq 10$	15
$10 < x \leq 15$	8
$15 < x \leq 20$	17
$20 < x \leq 25$	3

A frequency polygon is to be drawn from this table.

(a) Write down the coordinates of the point plotted for the class $0 < x \leq 5$.

(b) Work out the total frequency.

(c) Write down the modal class.

(Total for Question 11 is 4 marks)

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12 The grouped frequency table shows the waiting time, in minutes, at a bus stop for 60 passengers.

Wait, w (minutes)	Frequency
$0 < w \leq 10$	6
$10 < w \leq 20$	15
$20 < w \leq 30$	20
$30 < w \leq 40$	5
$40 < w \leq 50$	6
$50 < w \leq 60$	8

(a) Write down the modal class.

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

(c) Calculate an estimate for the mean. Give your answer to 1 decimal place.

(Total for Question 12 is 6 marks)

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13 The table shows the age, in years, of people at a swimming pool.

Class (years)	Frequency
$0 < x \leq 10$	15
$10 < x \leq 20$	2
$20 < x \leq 30$	2
$30 < x \leq 40$	4
$40 < x \leq 50$	8

A frequency polygon is to be drawn from this table.

(a) Write down the coordinates of the point plotted for the class $0 < x \leq 10$.

(b) Work out the total frequency.

(c) Write down the modal class.

(Total for Question 13 is 4 marks)

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14 The waiting time of 30 customers at a pharmacy, in minutes, is grouped below.

Class interval (minutes)	Frequency
$0 < w \leq 5$	6
$5 < w \leq 10$	14
$10 < w \leq 15$	10

Work out the class interval that contains the median waiting time.

(Total for Question 14 is 2 marks)

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Mark scheme · 3.11 Estimated Mean from Grouped Data: 1-hour Pack

Question 1

uses the midpoint of the class	**M1**
(27.5, 4) cao	**A1**
48 cao	**B1**
$10 < x \leq 15$	**B1**

Answer: (a) (27.5, 4); (b) 48; (c) $10 < x \leq 15$

Question 2

$50 < p \leq 70$ cao	**B1**
cumulative frequencies found; position 22 identified	**M1**
$50 < p \leq 70$ cao	**A1**
midpoints of at least 3 classes correct	**M1**
sum of (midpoint x frequency) = 2780 divided by 43	**M1**
64.7 cao	**A1**

Answer: (a) $50 < p \leq 70$; (b) $50 < p \leq 70$; (c) 64.7

Question 3

uses the midpoint of the class	**M1**
(30, 12) cao	**A1**
61 cao	**B1**
$0 < x \leq 20$	**B1**

Answer: (a) (30, 12); (b) 61; (c) $0 < x \leq 20$

Question 4

uses the midpoint of the class	**M1**
(70, 10) cao	**A1**
45 cao	**B1**
$40 < x \leq 60$	**B1**

Answer: (a) (70, 10); (b) 45; (c) $40 < x \leq 60$

Question 5

$15 < h \leq 20$ cao	**B1**
midpoints of at least 3 classes correct	**M1**
sum of (midpoint x frequency) = 720 divided by 56	**M1**
12.9 cao	**A1**

Answer: (a) $15 < h \leq 20$; (b) 12.9

Question 6

uses the midpoint of the class	**M1**
(55, 10) cao	**A1**
52 cao	**B1**
$60 < x \leq 70$	**B1**

Answer: (a) (55, 10); (b) 52; (c) $60 < x \leq 70$

Question 7

uses the midpoint of the class	**M1**
(5, 9) cao	**A1**
65 cao	**B1**
$40 < x \leq 50$	**B1**

Answer: (a) (5, 9); (b) 65; (c) $40 < x \leq 50$

Question 8

$20 < t \leq 30$ cao	**B1**
midpoints of at least 3 classes correct	**M1**
sum of (midpoint x frequency) = 1650 divided by 52	**M1**
31.7 cao	**A1**

Answer: (a) $20 < t \leq 30$; (b) 31.7

Question 9

uses the midpoint of the class	**M1**
(50, 9) cao	**A1**
30 cao	**B1**
$20 < x \leq 40$	**B1**

Answer: (a) (50, 9); (b) 30; (c) $20 < x \leq 40$

Question 10

cumulative frequencies found; position 34 identified	**M1**
$20 < h \leq 25$ cao	**A1**
midpoints of at least 3 classes correct	**M1**
sum of (midpoint x frequency) = 1542.5 divided by 67	**M1**
23.0 cao	**A1**
midpoint used for each class (exact values not known) oe	**B1**

Answer: (a) $20 < h \leq 25$; (b) 23.0; (c) the exact values are not known, so the midpoints are used

Question 11

uses the midpoint of the class	**M1**
(2.5, 9) cao	**A1**
52 cao	**B1**
$15 < x \leq 20$	**B1**

Answer: (a) (2.5, 9); (b) 52; (c) $15 < x \leq 20$

Question 12

$20 < w \leq 30$ cao	**B1**
cumulative frequencies found; position 61/2 identified	**M1**
$20 < w \leq 30$ cao	**A1**
midpoints of at least 3 classes correct	**M1**
sum of (midpoint x frequency) = 1640 divided by 60	**M1**
27.3 cao	**A1**

Answer: (a) $20 < w \leq 30$; (b) $20 < w \leq 30$; (c) 27.3

Question 13

uses the midpoint of the class	**M1**
(5, 15) cao	**A1**
31 cao	**B1**
$0 < x \leq 10$	**B1**

Answer: (a) (5, 15); (b) 31; (c) $0 < x \leq 10$

Question 14

cumulative frequencies 6, 20, 30 found and the middle position (half(30+1) = 15.5th value) identified	**M1**
$5 < w \leq 10$ cao	**A1**

Answer: $5 < w \leq 10$

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