2.14 Averages: 2-hour Pack

EDEXCEL 1MA1 · Calculator allowed · about 120 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Priya and Sam each play a video game 5 times. Their scores are shown below.
Priya: 12, 18, 9, 15, 21
Sam: 14, 16, 15, 17, 13

(a) Work out the mean score for Priya and the mean score for Sam. **(3)**

.....

(b) Work out the range of each person's scores. **(2)**

.....

(c) Ahmed says, 'Priya and Sam played equally well because they have the same mean score.' Comment on whether Ahmed is correct, using the range to support your answer. **(2)**

(Total for Question 1 is 7 marks)

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2 Here are the numbers of text messages sent by 8 students in one day:
12, 15, 12, 18, 20, 15, 12, 16

(a) Write down the mode of the number of messages sent. **(1)**

.....

(b) Find the median number of messages sent. **(2)**

.....

(c) Work out the range of the number of messages sent. **(1)**

.....

(d) Calculate the mean number of messages sent. **(2)**

.....

(Total for Question 2 is 6 marks)

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3 The table shows the number of bags carried by shoppers leaving a supermarket, recorded during a survey.

Number of bags	1	2	3	4
Frequency	6	9	7	3

(a) Work out how many shoppers took part in the survey. **(1)**

.....

(b) Write down the mode of the number of bags carried. **(1)**

.....

(c) Work out the number of shoppers who carried more than 2 bags. **(2)**

.....

(Total for Question 3 is 4 marks)

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4 A survey asked 20 students to name their favourite school subject. The results are shown in the table.

Subject	Maths	English	Science	Art
Frequency	6	4	7	3

(a) Write down the modal subject. **(1)**

.....

(b) Explain why it is not possible to calculate the mean or the median favourite subject. **(2)**

(Total for Question 4 is 3 marks)

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5 Here are the scores, relative to par, of 6 golfers after the first round of a tournament:
-3, 2, -1, 0, -5, 4

(a) Work out the range of the scores. **(2)**

.....

(b) Calculate the mean score. **(3)**

.....

(Total for Question 5 is 5 marks)

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6 The table shows the number of siblings reported by the students in a Year 8 class.

Number of siblings	0	1	2	3
Frequency	5	10	6	4

(a) Work out how many students were surveyed. **(1)**

.....

(b) Write down the modal number of siblings. **(1)**

.....

(c) Work out the number of students with at least 2 siblings. **(2)**

.....

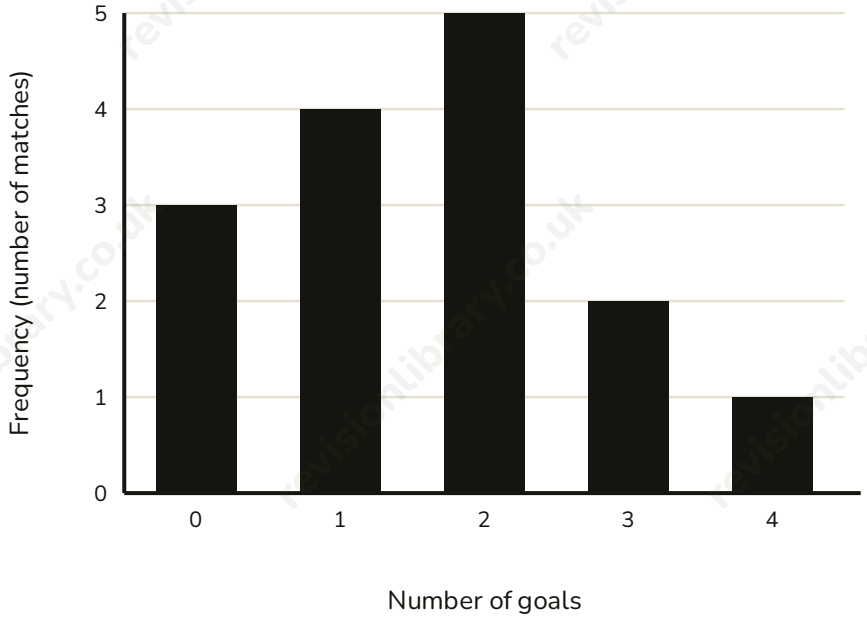
(d) Calculate the mean number of siblings. **(3)**

.....

(Total for Question 6 is 7 marks)

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7 The bar chart shows the number of goals scored by a hockey team in each of its matches this season.



(a) Write down the number of matches in which the team scored 2 goals. **(1)**

.....

(b) Work out the total number of matches played this season. **(1)**

.....

(c) Calculate the mean number of goals scored per match. **(3)**

.....

(Total for Question 7 is 5 marks)

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8 The stem-and-leaf diagram below shows the times, in minutes, taken by 15 runners to complete a fun run.

Stem	Leaf
2	5 8 9
3	0 1 3 4 6 7
4	0 2 5 8
5	1 3

Key: 2 | 5 means 25 minutes

(a) Write down the number of runners who took less than 30 minutes. **(1)**

.....

(b) Find the median time taken. **(2)**

.....

(c) Work out the range of the times. **(2)**

.....

(Total for Question 8 is 5 marks)

---

9 Grace recorded the number of steps she walked, in thousands, on 4 days. The mean number of steps per day was 8. On the 5th day she walked 13 thousand steps. Work out her new mean number of steps per day over the 5 days.

(Total for Question 9 is 3 marks)

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10 At a weekend running club, the combined mean finishing time for all 10 runners is 42 minutes. Of these 10 runners, 6 are in the beginners' group, with a mean finishing time of 38 minutes. The rest are in the advanced group. Work out the mean finishing time of the runners in the advanced group.

(Total for Question 10 is 4 marks)

---

11 Here are the delivery times, in minutes, for 13 parcels delivered by a courier in one day:
22, 35, 18, 40, 27, 31, 45, 29, 33, 38, 24, 50, 19

(a) Find the median delivery time. **(2)**

.....

(b) Work out the range of the delivery times. **(2)**

.....

(c) The courier says, 'Most parcels take about half an hour to deliver.' Use the median to comment on whether this claim is reasonable. **(2)**

(Total for Question 11 is 6 marks)

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12 Here are the shoe sizes of 10 dancers in a class:
4, 5, 4, 6, 7, 4, 8, 5, 4, 6
Write down the mode of the shoe sizes.

(Total for Question 12 is 1 mark)

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13 Here is the rainfall, in mm, recorded over 6 days:
0, 3, 12, 0, 7, 15
Work out the range of the rainfall.

(Total for Question 13 is 1 mark)

---

14 Here are the number of goals scored by a school football team in their last 9 matches:
2, 1, 0, 3, 1, 2, 1, 4, 1
Write down the mode of the number of goals scored.

(Total for Question 14 is 1 mark)

---

15 Here are the heights, in cm, of 7 sunflowers grown by a gardening club:
112, 98, 130, 105, 121, 99, 115
Work out the range of the heights.

(Total for Question 15 is 1 mark)

---

16 The table shows the favourite school lunch of 38 pupils.
Lunch: Sandwiches, Pasta, Pizza, Salad
Frequency: 7, 12, 15, 4
Write down the modal favourite lunch.

(Total for Question 16 is 1 mark)

---

17 Here are the points scored by a netball team in their last 5 matches:
34, 28, 41, 25, 37
Work out the mean number of points scored.

(Total for Question 17 is 2 marks)

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18 Here are the numbers of minutes 6 students spent on homework one evening:
35, 42, 28, 50, 33, 45
Work out the mean number of minutes. Give your answer correct to 1 decimal place.

(Total for Question 18 is 2 marks)

---

19 A cricket player scored the following runs in 5 innings:
24, 51, 33, 18, 39
Work out the mean number of runs scored.

(Total for Question 19 is 2 marks)

---

20 Here is the pocket money, in pounds, received by 6 students in one week:
5, 8, 12, 6, 10, 15
Work out the mean amount of pocket money. Give your answer correct to 2 decimal places.

(Total for Question 20 is 2 marks)

---

21 The mean of the four numbers x, x + 5, x + 7 and 15 is 12. Work out the value of x.

(Total for Question 21 is 3 marks)

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22 8 runners in Group X have a mean finishing time of 42 seconds. 12 runners in Group Y have a mean finishing time of 46 seconds. Work out the mean finishing time for all 20 runners combined.

(Total for Question 22 is 3 marks)

---

23 The table shows the number of siblings for each pupil in a class of 25.

Number of siblings	0	1	2	3	4
Frequency	6	10	5	3	1

Work out the mean number of siblings.

(Total for Question 23 is 3 marks)

---

24 The mean of 6 numbers is 15. A seventh number is added to the list, and the mean of all 7 numbers becomes 16. Work out the seventh number.

(Total for Question 24 is 3 marks)

---

25 A list of 6 numbers, placed in order, is:

4, 9, x, x + 3, 15, 20

The median of the list is 11. Work out the value of x.

(Total for Question 25 is 3 marks)

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26 The range of five numbers is 17. The greatest of the five numbers is 3g. The least of the five numbers is g - 1. Work out the value of g.

(Total for Question 26 is 3 marks)

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27 A list of 7 numbers, placed in order, is:
3, 8, 11, 2x - 1, 19, 24, 30
The median of the list is 15. Work out the value of x.

(Total for Question 27 is 3 marks)

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Mark scheme · 2.14 Averages: 2-hour Pack

A correct answer earns full marks unless the question asks for working, a method, proof or explanation.

Question 1

(a) Priya: 12+18+9+15+21 (= 75), oe **M1**

(a) Sam: 14+16+15+17+13 (= 75), oe **M1**

(a) both means = 15 cao **A1**

(a) Answer: Priya: 15, Sam: 15

(b) 21 - 9 and 17 - 13, oe (at least one correct range identified) **M1**

(b) Priya = 12 and Sam = 4, both cao **A1**

(b) Answer: Priya: 12, Sam: 4

(c) states that Ahmed is not (fully) correct / disagrees with Ahmed **B1**

(c) correct reason referring to the range, e.g. Sam's range (4) is smaller than Priya's range (12), so Sam's scores were more consistent, oe **B1**

(c) Answer: Ahmed is not correct. Although the means are equal, Sam's range (4) is much smaller than Priya's range (12), so Sam's scores were more consistent than Priya's.

Question 2

(a) 12 cao **B1**

(a) Answer: 12

(b) numbers placed in order: 12, 12, 12, 15, 15, 16, 18, 20, oe **M1**

(b) 15 cao **A1**

(b) Answer: 15

(c) 8 cao (20 - 12) **B1**

(c) Answer: 8

(d) (12 + 15 + 12 + 18 + 20 + 15 + 12 + 16) / 8, oe (sum = 120 seen) **M1**

(d) 15 cao **A1**

(d) Answer: 15

Question 3

(a) 25 cao (6 + 9 + 7 + 3) **B1**

(a) Answer: 25

(b) 2 cao **B1**

(b) Answer: 2

(c) 7 + 3, oe (frequencies for 3 bags and 4 bags identified) **M1**

(c) 10 cao **A1**

(c) Answer: 10

Question 4

(a) Science cao **B1**

(a) Answer: Science

(b) mean: subject names are not numbers, so they cannot be added and divided, oe **B1**

(b) median: the subjects have no numerical order, so they cannot be placed in order from lowest to highest, oe **B1**

(b) Answer: The mean cannot be calculated because the data (subject names) are not numbers, so they cannot be added and divided. The median cannot be found because the subjects cannot be placed in numerical order.

Question 5

(a) 4 and -5 identified as the highest and lowest values, oe (4 - (-5)) **M1**

(a) 9 cao **A1**

(a) Answer: 9

(b) -3 + 2 - 1 + 0 - 5 + 4 (= -3), oe **M1**

(b) -3 / 6 **M1**

(b) -0.5 cao **A1**

(b) Answer: -0.5

Question 6

(a) 25 cao (5 + 10 + 6 + 4) **B1**

(a) Answer: 25

(b) 1 cao **B1**

(b) Answer: 1

(c) 6 + 4, oe (frequencies for 2 siblings and 3 siblings identified) **M1**

(c) 10 cao **A1**

(c) Answer: 10

(d) fx products found: 0, 10, 12, 12, oe (at least 3 correct) **M1**

(d) (0 + 10 + 12 + 12) / 25 **M1**

(d) 1.36 cao **A1**

(d) Answer: 1.36 siblings

Question 7

(a) 5 cao **B1**

(a) Answer: 5

(b) 15 cao (3 + 4 + 5 + 2 + 1) **B1**

(b) Answer: 15

(c) fx products found: 0, 4, 10, 6, 4, oe (at least 3 correct) **M1**

(c) (0 + 4 + 10 + 6 + 4) / 15 **M1**

(c) 1.6 cao **A1**

(c) Answer: 1.6 goals

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Question 8

(a) 3 cao **B1**

(a) Answer: 3

(b) identifies the 8th value out of 15 ordered values **M1**

(b) 36 cao **A1**

(b) Answer: 36 minutes

(c) 53 - 25, oe **M1**

(c) 28 (minutes) cao **A1**

(c) Answer: 28 minutes

Question 9

8 x 4 (= 32), oe **M1**

32 + 13 (= 45), oe, / 5 **M1**

9 cao **A1**

Answer: 9 thousand steps

Question 10

10 x 42 (= 420), oe **M1**

6 x 38 (= 228), oe **M1**

(420 - 228) / (10 - 6), oe (192 / 4) **M1**

48 cao **A1**

Answer: 48 minutes

Question 11

(a) times placed in order: 18, 19, 22, 24, 27, 29, 31, 33, 35, 38, 40, 45, 50, oe **M1**

(a) 31 cao **A1**

(a) Answer: 31 minutes

(b) 50 - 18, oe **M1**

(b) 32 cao **A1**

(b) Answer: 32 minutes

(c) compares the median (31 minutes) with half an hour (30 minutes) **B1**

(c) valid comment, e.g. the median is very close to 30 minutes, so the claim is reasonable, oe **B1**

(c) Answer: The median (31 minutes) is very close to half an hour (30 minutes), so the courier's claim is reasonable.

Question 12

4 cao **B1**

Answer: 4

Question 13

15 (mm) cao **B1**

Answer: 15 mm

Question 14

1 cao **B1**

Answer: 1

Question 15

32 (cm) cao **B1**

Answer: 32 cm

Question 16

Pizza cao **B1**

Answer: Pizza

Question 17

34 + 28 + 41 + 25 + 37 (= 165) seen **M1**

33 cao **A1**

Answer: 33

Question 18

35+42+28+50+33+45 (= 233) seen, or 233/6 **M1**

38.8 (minutes), awrt 1dp **A1**

Answer: 38.8 minutes

Question 19

24 + 51 + 33 + 18 + 39 (= 165) seen **M1**

33 cao **A1**

Answer: 33

Question 20

5+8+12+6+10+15 (= 56) seen, or 56/6 **M1**

9.33 (pounds), awrt 2dp **A1**

Answer: £9.33

Question 21

4 x 12 = x + (x + 5) + (x + 7) + 15 (oe), leading to 3x + 27 = 48 **M1**

3x = 21 (oe) **M1**

x = 7 cao **A1**

Answer: x = 7

Question 22

8 x 42 (= 336) and 12 x 46 (= 552) both found **M1**

(336 + 552) / 20 (oe) **M1**

44.4 (seconds) cao **A1**

Answer: 44.4 seconds

Question 23

total frequency = 6+10+5+3+1 (= 25) used **M1**

(0x6)+(1x10)+(2x5)+(3x3)+(4x1) (= 33) found **M1**

1.32 cao **A1**

Answer: 1.32

Question 24

6 x 15 (= 90) found **M1**

7 x 16 (= 112) found **M1**

22 cao, from 112 - 90 **A1**

Answer: 22

Question 25

identifies that the median of 6 ordered values is the mean of the 3rd and 4th values: (x + (x + 3)) / 2 = 11 **M1**

2x + 3 = 22 (oe) **M1**

x = 9.5 cao **A1**

Answer: x = 9.5

Question 26

3g - (g - 1) (oe: = 2g + 1) **M1**

2g + 1 = 17, leading to 2g = 16 **M1**

g = 8 cao **A1**

Answer: g = 8

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Question 27

identifies that for 7 ordered values the median is the 4th value: 2x - 1 = 15	**M1**
2x = 16 (oe)	**M1**
x = 8 cao	**A1**

Answer: x = 8

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