3.1 Skewness by Inspection: 1-hour Pack

EDEXCEL 1ST0 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 For a data set, the mean is 57, the median is 42 and the standard deviation is 10. Use Pearson's coefficient of skewness = 3 x (mean - median) / standard deviation to work out the skewness, to 2 decimal places if needed, and describe the skew.

(Total for Question 1 is 3 marks)

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2 Here is a stem and leaf diagram, written out in rows, showing the journey times, in minutes, of 7 commuters.

1	**3 9 9**
2	
3	2
4	1 3
5	1

Key: 3 | 4 means 34

(a) Write down the mode.
(b) Find the median.
(c) Work out the range.

(Total for Question 2 is 5 marks)

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3 For marks in a test, the mean is 43, the median is 49 and the mode is 52. Describe the skewness of the distribution and give one piece of evidence from the three averages.

(Total for Question 3 is 2 marks)

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4 Here is a stem and leaf diagram, written out in rows, showing the lengths, in centimetres, of 15 fish caught in a competition.

1	**2 4 8 8**
2	2 5 6
3	0 3 6
4	1 4 5 8 9

Key: 3 | 4 means 34

(a) Find the median.
(b) Work out the interquartile range (use positions (n + 1)/4 and 3(n + 1)/4).
(c) How many of the values are greater than 30?

(Total for Question 4 is 6 marks)

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5 For marks in a test, the lower quartile is 35, the median is 53 and the upper quartile is 66.
(a) Work out (Q3 - Q2) and (Q2 - Q1).
(b) Hence describe the skewness.

(Total for Question 5 is 3 marks)

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6 Here is a stem and leaf diagram, written out in rows, showing the journey times, in minutes, of 11 commuters.

1	2
2	1 6 8
3	1 4 6 6 8
4	
5	1 3

Key: 3 | 4 means 34

(a) Write down the mode.
(b) Find the median.
(c) Work out the range.

(Total for Question 6 is 5 marks)

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7 For house prices in a town (in thousands of pounds), the mean is 24, the median is 30 and the mode is 36. Describe the skewness of the distribution and give one piece of evidence from the three averages.

(Total for Question 7 is 2 marks)

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8 For house prices in a town (in thousands of pounds), the mean is 50, the median is 53 and the mode is 58. Describe the skewness of the distribution and give one piece of evidence from the three averages.

(Total for Question 8 is 2 marks)

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9 Here is a stem and leaf diagram, written out in rows, showing the ages, in years, of 15 people on a coach trip.

1	**2 3 4 7**
2	1 1
3	0
4	2 6 8
5	1 2 5
6	0
7	9

Key: 3 | 4 means 34

(a) Find the median.
(b) Work out the range.
(c) How many of the values are greater than 21?

(Total for Question 9 is 6 marks)

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10 For marks in a test, the lower quartile is 31, the median is 36 and the upper quartile is 47.
(a) Work out (Q3 - Q2) and (Q2 - Q1).
(b) Hence describe the skewness.

(Total for Question 10 is 3 marks)

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11 Here is a stem and leaf diagram, written out in rows, showing the masses, in grams, of 19 chocolate bars.

3	**1 3 6 6 7 9**
4	4 6 6 6 7 8 9
5	2 4 6 9
6	6
7	1

Key: 3 | 4 means 34

(a) Find the median.
(b) Work out the range.
(c) How many of the values are greater than 37?

(Total for Question 11 is 6 marks)

12 For marks in a test, the mean is 43, the median is 43 and the mode is 43. Describe the skewness of the distribution and give one piece of evidence from the three averages.

(Total for Question 12 is 2 marks)

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13 Here is a stem and leaf diagram, written out in rows, showing the journey times, in minutes, of 11 commuters.

2	**3 3 6**
3	0 7 8
4	4 6
5	0 4 8

Key: 3 | 4 means 34

(a) Find the median.
(b) Work out the range.
(c) How many of the values are greater than 37?

(Total for Question 13 is 6 marks)

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14 For house prices in a town (in thousands of pounds), the mean is 30, the median is 25 and the mode is 22. Describe the skewness of the distribution and give one piece of evidence from the three averages.

(Total for Question 14 is 2 marks)

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15 For waiting times in minutes at a clinic, the mean is 59, the median is 59 and the mode is 59. Describe the skewness of the distribution and give one piece of evidence from the three averages.

(Total for Question 15 is 2 marks)

16 Here is a stem and leaf diagram, written out in rows, showing the number of sweets in 7 packets.

2	**2**
3	9
4	4 5 6 6 9

Key: 3 | 4 means 34

(a) Write down the mode.
(b) Find the median.
(c) Work out the range.

(Total for Question 16 is 5 marks)

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Mark scheme · 3.1 Skewness by Inspection: 1-hour Pack

Question 1

3 x (57 - 42) / 10	**M1**
4.5 cao	**A1**
positive skew	**B1**

Answer: 4.5; positive skew

Question 2

19 cao	**B1**
identifies the middle position (4th value)	**M1**
32 cao	**A1**
largest minus smallest	**M1**
38 cao	**A1**

Answer: (a) 19; (b) 32; (c) 38

Question 3

negative skew	**B1**
compares mean, median and mode: mean < median < mode	**B1**

Answer: negative skew

Question 4

identifies the middle position (8th value)	**M1**
30 cao	**A1**
quartiles found (18 and 44)	**M1**
26 cao	**A1**
counts leaves above 30	**M1**
7 cao	**A1**

Answer: (a) 30; (b) 26; (c) 7

Question 5

66 - 53 or 53 - 35	**M1**
13 and 18	**A1**
negative skew	**B1**

Answer: (a) 13 and 18; (b) negative skew

Question 6

36 cao	**B1**
identifies the middle position (6th value)	**M1**
34 cao	**A1**
largest minus smallest	**M1**
41 cao	**A1**

Answer: (a) 36; (b) 34; (c) 41

Question 7

negative skew	**B1**
compares mean, median and mode: mean < median < mode	**B1**

Answer: negative skew

Question 8

negative skew	**B1**
compares mean, median and mode: mean < median < mode	**B1**

Answer: negative skew

Question 9

identifies the middle position (8th value)	**M1**
42 cao	**A1**
largest minus smallest	**M1**
67 cao	**A1**
counts leaves above 21	**M1**
9 cao	**A1**

Answer: (a) 42; (b) 67; (c) 9

Question 10

47 - 36 or 36 - 31	**M1**
11 and 5	**A1**
positive skew	**B1**

Answer: (a) 11 and 5; (b) positive skew

Question 11

identifies the middle position (10th value)	**M1**
46 cao	**A1**
largest minus smallest	**M1**
40 cao	**A1**
counts leaves above 37	**M1**
14 cao	**A1**

Answer: (a) 46; (b) 40; (c) 14

Question 12

symmetrical (no skew)	**B1**
compares mean, median and mode: all three equal	**B1**

Answer: symmetrical (no skew)

Question 13

identifies the middle position (6th value)	**M1**
38 cao	**A1**
largest minus smallest	**M1**
35 cao	**A1**
counts leaves above 37	**M1**
6 cao	**A1**

Answer: (a) 38; (b) 35; (c) 6

Question 14

positive skew	**B1**
compares mean, median and mode: mean > median > mode	**B1**

Answer: positive skew

Question 15

symmetrical (no skew)	**B1**
compares mean, median and mode: all three equal	**B1**

Answer: symmetrical (no skew)

Question 16

46 cao	**B1**
identifies the middle position (4th value)	**M1**
45 cao	**A1**
largest minus smallest	**M1**
27 cao	**A1**

Answer: (a) 46; (b) 45; (c) 27

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