HIGHER

3.4 Standardised Scores: 1-hour Pack

EDEXCEL 1ST0 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 For 20 values of x, the sum of the values is 1200 and the sum of the squares of the values is 72826. Work out the standard deviation, using standard deviation = $\sqrt{\text{(sum of } x^2)/n - \text{mean}^2}$. Give your answer to 2 decimal places.

(Total for Question 1 is 4 marks)

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2 The masses of tins of beans have mean 69 g and standard deviation 10 g. A tin has a standardised score of 2. Work out the mass of the tin.

(Total for Question 2 is 2 marks)

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3 In a art test the mean mark is 66 and the standard deviation is 4. Ben scored 66. Work out Ben's standardised score, z = (x - mean) / standard deviation.

(Total for Question 3 is 2 marks)

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4 Here are the number of apples picked from 6 trees in an orchard.

30, 67, 54, 37, 46, 48

The mean is 47. Use standard deviation = $\sqrt{\text{sum of } (x - \text{mean})^2 / n}$ to work out the standard deviation. Give your answer to 2 decimal places.

(Total for Question 4 is 4 marks)

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5 The masses of tins of beans have mean 69 g and standard deviation 6 g. A tin has a standardised score of -2. Work out the mass of the tin.

(Total for Question 5 is 2 marks)

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6 In a maths test the mean mark is 47 and the standard deviation is 4. Tom scored 49. Work out Tom's standardised score, z = (x - mean) / standard deviation.

(Total for Question 6 is 2 marks)

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7 For 20 values of x, the sum of the values is 300 and the sum of the squares of the values is 5051. Work out the standard deviation, using standard deviation = $\sqrt{(\text{sum of } x^2)/n - \text{mean}^2}$. Give your answer to 2 decimal places.

(Total for Question 7 is 4 marks)

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8 In a science test the mean mark is 50 and the standard deviation is 4. Sofia scored 54. Work out Sofia's standardised score, z = (x - mean) / standard deviation.

(Total for Question 8 is 2 marks)

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9 The masses of tins of beans have mean 50 g and standard deviation 5 g. A tin has a standardised score of -2. Work out the mass of the tin.

(Total for Question 9 is 2 marks)

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10 Here are the marks scored by 5 pupils in a spelling test out of 30.

20, 14, 18, 29, 24

The mean is 21. Use standard deviation = $\sqrt{\text{sum of } (x - \text{mean})^2 / n}$ to work out the standard deviation. Give your answer to 2 decimal places.

(Total for Question 10 is 4 marks)

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11 In a maths test the mean mark is 59 and the standard deviation is 8. Carys scored 45. Work out Carys's standardised score, z = (x - mean) / standard deviation.

(Total for Question 11 is 2 marks)

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12 In a art test the mean mark is 49 and the standard deviation is 4. Quinn scored 47. Work out Quinn's standardised score, z = (x - mean) / standard deviation.

(Total for Question 12 is 2 marks)

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13 Here are the number of laps swum by Owen in each of 5 training sessions.

20, 34, 45, 20, 46

The mean is 33. Use standard deviation = $\sqrt{\text{sum of (x - mean)}^2 / \text{n}}$ to work out the standard deviation. Give your answer to 2 decimal places.

(Total for Question 13 is 4 marks)

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14 Freya scored 65 in geography (mean 53, standard deviation 5) and 41 in art (mean 45, standard deviation 8). Work out the standardised score for each subject and state in which subject Freya did relatively better.

(Total for Question 14 is 4 marks)

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15 The masses of tins of beans have mean 79 g and standard deviation 6 g. A tin has a standardised score of -2. Work out the mass of the tin.

(Total for Question 15 is 2 marks)

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16 For 20 values of x, the sum of the values is 1160 and the sum of the squares of the values is 69075. Work out the standard deviation, using standard deviation = $\sqrt{(\text{sum of } x^2)/n - \text{mean}^2}$. Give your answer to 2 decimal places.

(Total for Question 16 is 4 marks)

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17 Femi scored 44 in science (mean 52, standard deviation 5) and 54 in French (mean 63, standard deviation 8). Work out the standardised score for each subject and state in which subject Femi did relatively better.

(Total for Question 17 is 4 marks)

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18 Uma scored 58 in geography (mean 62, standard deviation 5) and 50 in computing (mean 54, standard deviation 8). Work out the standardised score for each subject and state in which subject Uma did relatively better.

(Total for Question 18 is 4 marks)

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19 Here are the number of minutes 8 trains were late.

18, 3, 20, 0, 11, 16, 16, 4

The mean is 11. Use standard deviation = $\sqrt{\text{sum of (x - mean)}^2 / \text{n}}$ to work out the standard deviation. Give your answer to 2 decimal places.

(Total for Question 19 is 4 marks)

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Mark scheme · 3.4 Standardised Scores: 1-hour Pack

Question 1

mean = 1200/20 = 60	**M1**
72826/20 - 60^2	**M1**
square root of a positive variance	**M1**
6.43 cao	**A1**

Answer: 6.43

Question 2

mass = 69 + (2 x 10)	**M1**
89 cao	**A1**

Answer: 89 g

Question 3

(66 - 66) / 4	**M1**
0 cao	**A1**

Answer: 0

Question 4

deviations from the mean found (at least 4 correct)	**M1**
squares summed (840) and divided by 6	**M1**
square root taken	**M1**
11.83 cao	**A1**

Answer: 11.83

Question 5

mass = 69 + (-2 x 6)	**M1**
57 cao	**A1**

Answer: 57 g

Question 6

(49 - 47) / 4	**M1**
0.5 cao	**A1**

Answer: 0.5

Question 7

mean = 300/20 = 15	**M1**
5051/20 - 15^2	**M1**
square root of a positive variance	**M1**
5.25 cao	**A1**

Answer: 5.25

Question 8

(54 - 50) / 4	**M1**
1 cao	**A1**

Answer: 1

Question 9

mass = 50 + (-2 x 5)	**M1**
40 cao	**A1**

Answer: 40 g

Question 10

deviations from the mean found (at least 4 correct)	**M1**
squares summed (132) and divided by 5	**M1**
square root taken	**M1**
5.14 cao	**A1**

Answer: 5.14

Question 11

(45 - 59) / 8	**M1**
-1.75 cao	**A1**

Answer: -1.75

Question 12

(47 - 49) / 4	**M1**
-0.5 cao	**A1**

Answer: -0.5

Question 13

deviations from the mean found (at least 4 correct)	**M1**
squares summed (652) and divided by 5	**M1**
square root taken	**M1**
11.42 cao	**A1**

Answer: 11.42

Question 14

(65 - 53) / 5	**M1**
(41 - 45) / 8	**M1**
z = 2.4 and z = -0.5 cao	**A1**
geography (higher standardised score)	**B1**

Answer: geography: 2.4; art: -0.5; better in geography

Question 15

mass = 79 + (-2 x 6)	**M1**
67 cao	**A1**

Answer: 67 g

Question 16

mean = 1160/20 = 58	**M1**
69075/20 - 58^2	**M1**
square root of a positive variance	**M1**
9.47 cao	**A1**

Answer: 9.47

Question 17

(44 - 52) / 5	**M1**
(54 - 63) / 8	**M1**
z = -1.6 and z = -1.13 cao	**A1**
French (higher standardised score)	**B1**

Answer: science: -1.6; French: -1.13; better in French

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Question 18

(58 - 62) / 5	**M1**
(50 - 54) / 8	**M1**
z = -0.8 and z = -0.5 cao	**A1**
computing (higher standardised score)	**B1**

Answer: geography: -0.8; computing: -0.5; better in computing

Question 19

deviations from the mean found (at least 4 correct)	**M1**
squares summed (414) and divided by 8	**M1**
square root taken	**M1**
7.19 cao	**A1**

Answer: 7.19

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