6.9 Comparing Distributions: 2-hour Pack

Calculators not allowed · about 120 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Here are the times, in seconds, of two runners over several races.
Runner A: 14, 5, 15, 28, 23, 17, 34
Runner B: 26, 7, 35, 29, 21, 8, 35
Compare the two runners using the median and the range.

(4)

2 Here are summary statistics for goals.
Team A: mean 19, range 18.
Team B: mean 29, range 10.
Compare the two sets of data.

(2)

3 Here are the times, in seconds, of two runners over several races.
Runner A: 30, 30, 35, 37, 27
Runner B: 8, 30, 29, 27, 18
Compare the two runners using the median and the range.

(4)

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4 Here are summary statistics for minutes.
Ali: mean 14, range 15.
Bea: mean 17, range 5.
Compare the two sets of data.

(2)

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5 Here are summary statistics for goals.
Team A: mean 24, range 19.
Team B: mean 12, range 9.
Compare the two sets of data.

(2)

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6 Here are the times, in seconds, of two runners over several races.
Runner A: 22, 25, 10, 29, 32, 8, 23
Runner B: 24, 15, 29, 38, 23, 7, 24
Compare the two runners using the median and the range.

(4)

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7 Here are 6 numbers: 21, 8, 22, 26, 26, 26.
Work out the mean, the median and the range.

(3)

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8 Here are the times, in seconds, of two runners over several races.
Runner A: 39, 26, 14, 23, 27, 12, 6
Runner B: 29, 38, 8, 21, 15
Compare the two runners using the median and the range.

(4)

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9 Here are 6 numbers: 6, 9, 7, 11, 3, 3.
Work out the mean, the median and the range.

(3)

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10 Here are summary statistics for goals.
Team A: mean 15, range 9.
Team B: mean 29, range 14.
Compare the two sets of data.

(2)

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11 A frequency table shows times (minutes) taken by pupils to run 1 km.
Times: 4, 5, 6 with frequencies 3, 4, 3 respectively. Work out the mean time.

(2)

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12 Here are the times, in seconds, of two runners over several races.
Runner A: 29, 11, 11, 29, 9, 33, 30
Runner B: 35, 16, 7, 34, 38, 37, 30
Compare the two runners using the median and the range.

(4)

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13 Here are summary statistics for minutes.
Ali: mean 12, range 11.
Bea: mean 21, range 6.
Compare the two sets of data.

(2)

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14 Here are 10 numbers: 30, 21, 7, 28, 13, 17, 23, 17, 27, 17.
Work out the mean, the median and the range.

(3)

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15 Here are summary statistics for minutes.
Ali: mean 18, range 16.
Bea: mean 23, range 18.
Compare the two sets of data.

(2)

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16 Here are the times, in seconds, of two runners over several races.
Runner A: 9, 21, 12, 7, 16, 11, 24
Runner B: 34, 9, 22, 10, 28
Compare the two runners using the median and the range.

(4)

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17 Here are summary statistics for minutes.
Ali: mean 15, range 17.
Bea: mean 14, range 9.
Compare the two sets of data.

(2)

---

18 Here are summary statistics for goals.
Team A: mean 15, range 16.
Team B: mean 11, range 4.
Compare the two sets of data.

(2)

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19 Here are summary statistics for minutes.
Ali: mean 25, range 19.
Bea: mean 30, range 11.
Compare the two sets of data.

(2)

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20 Here are the times, in seconds, of two runners over several races.
Runner A: 21, 14, 32, 34, 14
Runner B: 12, 9, 7, 20, 14
Compare the two runners using the median and the range.

(4)

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21 Here are summary statistics for marks.
Class 8X: mean 25, range 7.
Class 8Y: mean 10, range 14.
Compare the two sets of data.

(2)

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22 Here are 10 numbers: 27, 24, 22, 29, 14, 5, 22, 22, 20, 20.
Work out the mean, the median and the range.

(3)

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23 Here are summary statistics for minutes.
Ali: mean 21, range 20.
Bea: mean 24, range 6.
Compare the two sets of data.

(2)

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24 The times in minutes that 6 people spent in a queue are: 12, 12, 14, 15, 18, 139.
Work out the mean and the median. Which average is a better summary of a typical wait? Give a reason.

(4)

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25 Here are summary statistics for minutes.
Ali: mean 17, range 6.
Bea: mean 11, range 8.
Compare the two sets of data.

(2)

---

26 Here are the times, in seconds, of two runners over several races.
Runner A: 6, 25, 26, 9, 30
Runner B: 34, 40, 6, 37, 6
Compare the two runners using the median and the range.

(4)

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27 Here are summary statistics for minutes.
Ali: mean 24, range 9.
Bea: mean 23, range 4.
Compare the two sets of data.

(2)

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28 Here are the times, in seconds, of two runners over several races.
Runner A: 24, 34, 26, 31, 39
Runner B: 39, 34, 39, 24, 14, 23, 18
Compare the two runners using the median and the range.

(4)

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29 Here are summary statistics for goals.
Team A: mean 30, range 6.
Team B: mean 20, range 14.
Compare the two sets of data.

(2)

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30 Here are the times, in seconds, of two runners over several races.
Runner A: 29, 15, 30, 18, 37
Runner B: 8, 39, 23, 9, 32
Compare the two runners using the median and the range.

(4)

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31 Here are the times, in seconds, of two runners over several races.
Runner A: 18, 29, 15, 32, 15
Runner B: 36, 37, 40, 35, 10
Compare the two runners using the median and the range.

(4)

32 The times in minutes that 6 people spent in a queue are: 23, 23, 24, 27, 30, 125.
Work out the mean and the median. Which average is a better summary of a typical wait? Give a reason.

(4)

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Mark scheme · 6.9 Comparing Distributions: 2-hour Pack

Question 1

medians 17 and 26	B1
ranges 29 and 28	B1
comparison of medians: Runner B has the higher median	B1
comparison of ranges: Runner B is more consistent	B1

Answer: **Runner B has the higher median (17 and 26); Runner B is more consistent (ranges 29 and 28)**

Question 2

comparison of the averages: Team B has the higher mean	B1
comparison of the spread: Team B is more consistent (smaller range)	B1

Answer: **Team B has the higher mean; Team B is more consistent as it has the smaller range**

Question 3

medians 30 and 27	B1
ranges 10 and 22	B1
comparison of medians: Runner A has the higher median	B1
comparison of ranges: Runner A is more consistent	B1

Answer: **Runner A has the higher median (30 and 27); Runner A is more consistent (ranges 10 and 22)**

Question 4

comparison of the averages: Bea has the higher mean	B1
comparison of the spread: Bea is more consistent (smaller range)	B1

Answer: **Bea has the higher mean; Bea is more consistent as it has the smaller range**

Question 5

comparison of the averages: Team A has the higher mean	B1
comparison of the spread: Team B is more consistent (smaller range)	B1

Answer: **Team A has the higher mean; Team B is more consistent as it has the smaller range**

Question 6

medians 23 and 24	B1
ranges 24 and 31	B1
comparison of medians: Runner B has the higher median	B1
comparison of ranges: Runner A is more consistent	B1

Answer: **Runner B has the higher median (23 and 24); Runner A is more consistent (ranges 24 and 31)**

Question 7

mean 21.5	B1
median 24	B1
range 18	B1

Answer: **mean 21.5, median 24, range 18**

Question 8

medians 23 and 21	B1
ranges 33 and 30	B1
comparison of medians: Runner A has the higher median	B1
comparison of ranges: Runner B is more consistent	B1

Answer: **Runner A has the higher median (23 and 21); Runner B is more consistent (ranges 33 and 30)**

Question 9

mean 6.5	B1
median 6.5	B1
range 8	B1

Answer: **mean 6.5, median 6.5, range 8**

Question 10

comparison of the averages: Team B has the higher mean	B1
comparison of the spread: Team A is more consistent (smaller range)	B1

Answer: **Team B has the higher mean; Team A is more consistent as it has the smaller range**

Question 11

correct use of (4*3 + 5*4 + 6*3) and total frequency 10 or equivalent	M1
mean = 5.0 minutes cao	A1

Answer: **5.0 minutes (or 5)**

Question 12

medians 29 and 34	B1
ranges 24 and 31	B1
comparison of medians: Runner B has the higher median	B1
comparison of ranges: Runner A is more consistent	B1

Answer: **Runner B has the higher median (29 and 34); Runner A is more consistent (ranges 24 and 31)**

Question 13

comparison of the averages: Bea has the higher mean	B1
comparison of the spread: Bea is more consistent (smaller range)	B1

Answer: **Bea has the higher mean; Bea is more consistent as it has the smaller range**

Question 14

mean 20	B1
median 19	B1
range 23	B1

Answer: **mean 20, median 19, range 23**

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Question 15

comparison of the averages: Bea has the higher mean **B1**

comparison of the spread: Ali is more consistent (smaller range) **B1**

Answer: **Bea has the higher mean; Ali is more consistent as it has the smaller range**

Question 16

medians 12 and 22 **B1**

ranges 17 and 25 **B1**

comparison of medians: Runner B has the higher median **B1**

comparison of ranges: Runner A is more consistent **B1**

Answer: **Runner B has the higher median (12 and 22); Runner A is more consistent (ranges 17 and 25)**

Question 17

comparison of the averages: Ali has the higher mean **B1**

comparison of the spread: Bea is more consistent (smaller range) **B1**

Answer: **Ali has the higher mean; Bea is more consistent as it has the smaller range**

Question 18

comparison of the averages: Team A has the higher mean **B1**

comparison of the spread: Team B is more consistent (smaller range) **B1**

Answer: **Team A has the higher mean; Team B is more consistent as it has the smaller range**

Question 19

comparison of the averages: Bea has the higher mean **B1**

comparison of the spread: Bea is more consistent (smaller range) **B1**

Answer: **Bea has the higher mean; Bea is more consistent as it has the smaller range**

Question 20

medians 21 and 12 **B1**

ranges 20 and 13 **B1**

comparison of medians: Runner A has the higher median **B1**

comparison of ranges: Runner B is more consistent **B1**

Answer: **Runner A has the higher median (21 and 12); Runner B is more consistent (ranges 20 and 13)**

Question 21

comparison of the averages: Class 8X has the higher mean **B1**

comparison of the spread: Class 8X is more consistent (smaller range) **B1**

Answer: **Class 8X has the higher mean; Class 8X is more consistent as it has the smaller range**

Question 22

mean 20.5 **B1**

median 22 **B1**

range 24 **B1**

Answer: **mean 20.5, median 22, range 24**

Question 23

comparison of the averages: Bea has the higher mean **B1**

comparison of the spread: Bea is more consistent (smaller range) **B1**

Answer: **Bea has the higher mean; Bea is more consistent as it has the smaller range**

Question 24

mean 35 **B1**

median 14.5 **B1**

median chosen **B1**

reason: 139 is an extreme value which pulls the mean up **B1**

Answer: **mean 35, median 14.5; the median is better because 139 is an extreme value**

Question 25

comparison of the averages: Ali has the higher mean **B1**

comparison of the spread: Ali is more consistent (smaller range) **B1**

Answer: **Ali has the higher mean; Ali is more consistent as it has the smaller range**

Question 26

medians 25 and 34 **B1**

ranges 24 and 34 **B1**

comparison of medians: Runner B has the higher median **B1**

comparison of ranges: Runner A is more consistent **B1**

Answer: **Runner B has the higher median (25 and 34); Runner A is more consistent (ranges 24 and 34)**

Question 27

comparison of the averages: Ali has the higher mean **B1**

comparison of the spread: Bea is more consistent (smaller range) **B1**

Answer: **Ali has the higher mean; Bea is more consistent as it has the smaller range**

Question 28

medians 31 and 24 **B1**

ranges 15 and 25 **B1**

comparison of medians: Runner A has the higher median **B1**

comparison of ranges: Runner A is more consistent **B1**

Answer: **Runner A has the higher median (31 and 24); Runner A is more consistent (ranges 15 and 25)**

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Question 29

comparison of the averages: Team A has the higher mean	**B1**
comparison of the spread: Team A is more consistent (smaller range)	**B1**

Answer: **Team A has the higher mean; Team A is more consistent as it has the smaller range**

Question 30

medians 29 and 23	**B1**
ranges 22 and 31	**B1**
comparison of medians: Runner A has the higher median	**B1**
comparison of ranges: Runner A is more consistent	**B1**

Answer: **Runner A has the higher median (29 and 23); Runner A is more consistent (ranges 22 and 31)**

Question 31

medians 18 and 36	**B1**
ranges 17 and 30	**B1**
comparison of medians: Runner B has the higher median	**B1**
comparison of ranges: Runner A is more consistent	**B1**

Answer: **Runner B has the higher median (18 and 36); Runner A is more consistent (ranges 17 and 30)**

Question 32

mean 42	**B1**
median 25.5	**B1**
median chosen	**B1**
reason: 125 is an extreme value which pulls the mean up	**B1**

Answer: **mean 42, median 25.5; the median is better because 125 is an extreme value**

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