GCSE Maths: Comparing distributions (Foundation): answers

GCSE Maths - Statistics - Foundation - Lesson 24.11

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at **websink.site/gcse/maths/ch24-statistics/foundation/comparing-distributions/**

Exercise 24K Comparing distributions Non-calculator

1 **Compare the two sets of data using the mean and the range. Write your answer in context.**

(a) Scores of Amy: 7, 9, 6, 8, 10 and of Ben: 4, 10, 5, 9, 7 in five tests.

Answer: On average, Amy has the higher scores (mean 8 compared with 7). Amy is more consistent (smaller range: 4 compared with 6), so Ben is more spread out.

(b) Heights in cm of six girls: 150, 154, 148, 152, 156, 150 and six boys: 145, 160, 152, 148, 158, 157.

Answer: On average, The boys has the greater height (mean 153.3 compared with 151.7). The girls is more consistent (smaller range: 8 compared with 15), so The boys is more spread out.

(c) Waiting times in minutes at two clinics, A: 12, 15, 9, 14, 10 and B: 20, 8, 25, 6, 11.

Answer: On average, Clinic B has the longer waiting time (mean 14 compared with 12). Clinic A is more consistent (smaller range: 6 compared with 19), so Clinic B is more spread out.

2 **Two players scored goals in seven matches. Player X: 1, 0, 3, 2, 1, 0, 2. Player Y: 0, 5, 0, 0, 1, 6, 0. Compare the goals scored using the mean and the range.**

Answer: On average, Player Y has the higher goals (mean 1.7 compared with 1.3). Player X is more consistent (smaller range: 3 compared with 6), so Player Y is more spread out.

3 **The ages of the people in two shops are shown.**
Shop 1: 20, 22, 21, 23, 22, 65
Shop 2: 30, 32, 31, 33, 30, 34
Compare the ages using the median and the range. Explain why the median is better than the mean for Shop 1.

Answer: On average, Shop 2 has the higher age (median 31.5 compared with 22). Shop 2 is more consistent (smaller range: 4 compared with 45), so Shop 1 is more spread out.

4 **The frequency tables show the number of goals scored in 20 matches by two teams.**
Team P

Goals	0	1	2	3	4
Matches	4	7	6	2	1

Team Q

Goals	0	1	2	3	4
Matches	1	3	8	6	2

Which team scores more goals on average? Compare the means and give the range for each team.

(a) Mean for team P

Answer: 1.45

(b) Mean for team Q

Answer: 2.25

(c) Range for team P

Answer: 4

(d) Range for team Q

Answer: 4

(e) Comparison

Answer: Team Q scores more on average (mean 2.25 compared with 1.45). The ranges are both 4, so the spread is the same.

5 **Hannah says: "Class A has a mean mark of 64 and class B has a mean mark of 61, so everyone in class A did better than everyone in class B." Explain why she is wrong.**

Answer: A mean is an average of the whole class, so individual students in class B may have done better than students in class A.

6 **Complete the comparison. "The mean for team A is 12 and the mean for team B is 15. The range for A is 5 and the range for B is 14." Write two sentences comparing the teams.**

Answer: Team B has the higher average (15 compared with 12), but team A is more consistent (range 5 compared with 14).

7 **Two archers shoot seven arrows each. Their scores out of 10 are: Archer 1: 6, 7, 7, 8, 8, 8, 9. Archer 2: 3, 6, 8, 8, 9, 10, 10. A coach must choose one archer for a team who needs consistent scores. Which archer should be chosen? Use averages and ranges to justify your answer.**

Answer: On average, Archer 2 has the higher score (mean 7.7 compared with 7.6). Archer 1 is more consistent (smaller range: 3 compared with 7), so Archer 2 is more spread out.

8 **Sam says: "Class X has a range of 35 and class Y has a range of 20, so class X must have the higher mean." Is he right? Explain.**

Answer: No: the range measures spread, not the average.

9 **The numbers of points scored by two players in five games are: Player A: 4, 6, 5, 7, 8. Player B: 3, 9, 5, 4, 10. Compare the points using the median and the range.**

Answer: On average, Player A has the higher points (median 6 compared with 5). Player A is more consistent (smaller range: 4 compared with 7), so Player B is more spread out.

10 **The battery lives, in hours, of five phones of each type are: Phone A: 14, 15, 13, 14, 16. Phone B: 10, 18, 12, 19, 16. A customer wants a phone with a reliable battery life. Which should the customer choose? Use the mean and the range.**

Answer: On average, Phone B has the higher battery life (mean 15 compared with 14.4). Phone A is more consistent (smaller range: 3 compared with 9), so Phone B is more spread out.

11 **Team X has a mean of 30 points and a range of 6. Team Y has a mean of 24 points and a range of 10. Write two sentences to compare the teams.**

Answer: Team X scored more on average (mean 30 compared with 24) and was more consistent (range 6 compared with 10).

12 **Write down two sets of five numbers, P and Q, so that P has the higher mean but the smaller range. Show that your sets work.**

> **Answer:** For example P: 10, 11, 12, 12, 13 and Q: 2, 4, 6, 8, 20.

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