

GCSE Maths: Comparing distributions (Higher): answers

GCSE Maths - Statistics - Higher - 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/higher/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 The interquartile ranges of two groups are 4 and 9, and the medians are 52 and 50. Write a comparison of the two groups.

Answer: Group 1 has the higher median (52 compared with 50) and is more consistent (IQR 4 compared with 9).

- 9 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.

- 10 The mean height of 5 players in team A is 180 cm. The mean height of 5 players in team B is 176 cm. One player from each team swaps teams. Team A's new mean is 178 cm. How tall is the player who joined team A, if the player who left was 190 cm?

Answer: 180 cm

- 11 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.

- 12 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.

- 13** 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).

- 14** 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.