

Pack A • Fluency

Answer all questions. Show your working. Questions are grouped by challenge level.

1. Find the mode of: 3, 7, 3, 9, 5, 3, 7. Justify by stating how many times it appears compared to all other values.

2. Find the median of: 5, 2, 8, 1, 6. Explain what you had to do before finding the middle value and why.

3. Three numbers have a mean of 6. Two of the numbers are 4 and 10. Find the third number and justify using the definition of mean.

4. Find the range of: 12, 5, 18, 9, 3. Explain what the range tells us about the spread of the data.

5. A bar chart shows books read: Fiction 14, Non-fiction 9, Comics 5. A student says "Fiction is more than double Non-fiction." Is this correct? Justify.

6. A frequency table shows favourite colours: Red = 8, Blue = 12, Green = 5, Yellow = 3. (a) How many students were surveyed? (b) Is "favourite colour" categorical or numerical data? Justify.

7. A shoe-size frequency table shows: Size 4: 3; Size 5: 8; Size 6: 5; Size 7: 2 students. State the mode and explain why it is called the modal size.

8. Find the median of: 3, 11, 7, 1, 9, 5. Explain why you average the two middle values instead of picking just one.

9. A pie chart shows how 30 students travel to school: Walking = 10, Bus = 15, Car = 5. What fraction walk? Justify that the fractions for all groups must add to 1.

10. A bar chart is drawn for: Mon = 4, Tue = 6, Wed = 2, Thu = 8. A student wants the vertical axis to go up in steps of 3. Explain why this is a poor choice and suggest a better scale step. Justify.

11. A frequency table shows scores out of 10: Score 6: 4 students; Score 8: 3 students; Score 10: 3 students. Find the mean score.
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12. Find the median of this data set: 14, 3, 21, 9, 17, 5, 11, 8, 25, 13, 7.
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13. Two classes sit a spelling test. Class A scores: 6, 8, 7, 9, 5. Class B scores: 4, 10, 6, 9, 1. Compare the means and ranges of the two classes.
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14. A survey of 30 people found 10 prefer comedy films. What angle (in degrees) should the comedy sector be in a pie chart?
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15. A two-way table shows student choices. Year 7: Swimming 14, Tennis 11, Total 25. Year 8: Swimming 9, Tennis 16, Total 25. How many students play tennis altogether?
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16. The mean of four numbers is 8. Three of them are 5, 9, 6. Find the fourth number.
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17. A pie chart for 36 students has a sector of 120° for "Football". How many students chose Football?
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18. For the data set 4, 7, 4, 9, 4, 7, 3, 9, find (a) the mode and (b) the median.
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19. Five plants are measured (cm): 12.4, 9.7, 11.3, 10.6, 13.5. Find the mean height, rounding to 1 decimal place.
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20. A bar chart shows daily visitors to a café over 5 days: Mon 40, Tue 55, Wed 50, Thu 45, Fri 60. Calculate the mean number of daily visitors.
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21. The mean of 5 test scores is 78. 4 of the scores are 65, 80, 70, 90. Find the missing score.
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22. A pie chart has a sector of 90° . (a) What fraction of the data does it represent? (b) What percentage?
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23. Team A sprint times (s): 11.2, 12.4, 11.8, 13.0, 11.6. Team B sprint times (s): 10.5, 14.1, 11.9, 12.5, 11.0. Compare the two distributions using the mean and range.
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24. 6 friends share a total of 48 sweets equally. Then 12 more sweets are added and shared equally among the same group. How many sweets does each person have now?
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25. Eight students score: 5, 6, 6, 7, 7, 7, 8, 40. (a) Find the mean, median, and mode. (b) Which average best represents the data? Explain.
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26. A survey of 60 people found: Category A = 20, Category B = 25, Category C = 15. Calculate the angle for each sector to draw a pie chart.
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27. The mean of seven numbers is 12. Six of the numbers have a sum of 74. Write and solve an equation to find the seventh number.
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28. A pie chart shows that 35% of 60 students chose Science as their favourite subject. How many students is that?
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29. A company has 10 employees. The 2 managers each earn £100000; the remaining 8 staff each earn £20000. (a) Calculate the actual mean salary. (b) Explain why the mean might be misleading as a "typical" salary.
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30. A data set has 5 whole numbers. The mode is 6, the range is 8, and the mean is 7. Write one possible data set.
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31. Five positive integers have mean 11, median 10, and range 6. List one possible set of numbers.
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32. Daily temperatures ($^{\circ}\text{C}$) for one week: 3, -2, 0, 4, -1, 5, -3. Find the mean and range.
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33. A market stall records daily profit (+) or loss (-) in £ over 5 days: 35, -12, 48, -20, 9. Find the mean daily profit/loss.
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34. A student has sat 4 assessments with a current mean of 65. She wants her overall mean to be 70 after a total of 6 assessments. What total must she score across the remaining 2 assessments?
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35. Two archers each shoot 6 arrows. Archer A distances from bullseye (cm): 3, 5, 4, 6, 3, 3. Archer B: 2, 8, 1, 9, 2, 8. Compare using mean and range, and state which archer you would pick for a competition.
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36. A class of 40 students chose a sport. Results: Football = 16, Tennis = 8, Swimming = 10, Other = 6. Calculate the angle and percentage for each sector.
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37. The sum of 12 data values is 156. Without dividing, use prime factorisation to check whether the mean will be a whole number. Then calculate the mean.
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38. A pie chart shows how a school spends its budget of £200000. Teaching staff = 60%, Resources = 20%, Premises = 15%, Other = 5%. (a) Calculate the amount spent on each category. (b) What angle represents Premises in the pie chart?
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39. Lengths of 30 leaves are grouped: 1–3 cm: 6 leaves; 3–5 cm: 14 leaves; 5–7 cm: 10 leaves. Use midpoints to estimate the mean length.
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40. A data set is: x , 8, 14, $2x$, 6. The mean of the data set is 11. Form an equation and solve it to find x .
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