CLASS 8 · MATHEMATICS

# Tales by Dots and Lines

## Sample paper · 15 questions · 22 marks

10 objective questions × 1 mark. Five written-response questions: 12 marks. Write your working where needed. Suggested time: 45 minutes. Answers and marking guidance follow the questions.

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## Section A · Objective questions (10 marks)

1. The mean of 6, 10, 14, 18 and 22 is:

A. 12

B. 14

C. 16

D. 70

2. For any two numbers, their mean lies:

A. Closer to the smaller number

B. Closer to the larger number

C. Exactly halfway between them

D. Anywhere between them

3. A new value greater than the mean is added to a data set. The mean will:

A. Decrease

B. Stay the same

C. Increase

D. Become zero

4. A new value exactly equal to the mean is added to a data set. The mean will:

A. Stay the same

B. Decrease slightly

C. Double

D. Increase slightly

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5. The mean of 5 numbers is 20. The total of the 5 numbers is:

A. 25

B. 4

C. 100

D. 15

6. The mean of 10, 10, 11 and 17 is:

A. 48

B. 11

C. 12

D. 13

7. A line graph is usually the best choice to show:

A. The share of each cost in a budget

B. How a value changes over time

C. The heights of different buildings

D. Which fruit is most popular in class

8. To show how the temperature changed through one day, the most suitable display is:

A. A tally table alone

B. A line graph

C. A bar graph of categories

D. A pictograph

9. If every value in a data set is increased by 3, the mean:

A. Increases by 3 times the count

B. Is multiplied by 3

C. Stays the same

D. Increases by 3

10. A value smaller than the mean is removed from a data set. The mean of the remaining values will:

A. Increase

B. Become negative

C. Decrease

D. Stay the same

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# Section B · Written responses (12 marks)

Attempt all five. Use a separate sheet if you need more space. The marks for each question are shown.

11. Find the mean of 12, 15, 18, 21 and 24. Then show that the distances of the values below the mean balance the distances above it. [2 marks]

12. The mean of 4 numbers is 25. A fifth number, 40, is added to the set. Find the new mean. [2 marks]

13. Using the fair-share idea of the mean, explain what the mean of 2, 5 and 8 chocolates tells us about three children sharing their chocolates equally. [2 marks]

14. A cricketer scores 45, 60, 30, 75 and 40 in five matches. Find her mean score. In the sixth match she scores 80. Without full calculation, say whether the mean will rise or fall, then compute the new mean. [3 marks]

15. Give one situation where a line graph is the right choice and one where a bar graph is better, with reasons. Also name one way a graph can mislead a reader. [3 marks]

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# Answers & marking guidance

Use these after attempting the paper. Accept equivalent correct reasoning and sensible units. These are Evater model answers, not an official marking scheme.

## Section A · 1 mark each

1. B — The sum is 70 and there are 5 values, so the mean is 70 / 5 = 14.

2. C — The mean of two numbers is exactly midway between them on the number line.

3. C — Including a value above the mean pulls the balance point up, so the mean increases.

4. A — Adding a value equal to the mean does not shift the balance point, so the mean is unchanged.

5. C — Total = mean x count = 20 x 5 = 100.

6. C — The sum is 48 and 48 / 4 = 12.

7. B — Line graphs suit continuous change over time; bar graphs compare separate categories and pie charts show shares.

8. B — Temperature varies continuously with time, and a line graph shows that trend clearly.

9. D — Adding 3 to every value raises the total by 3 x count, so the mean rises by exactly 3.

10. A — Removing a below-average value leaves a higher balance point, so the mean increases.

## Section B · Model answers

11. Mean = (12 + 15 + 18 + 21 + 24) / 5 = 90 / 5 = 18. Distances below: 18 - 12 = 6 and 18 - 15 = 3, totalling 9. Distances above: 21 - 18 = 3 and 24 - 18 = 6, totalling 9. The two sides balance, which is why 18 is the centre of the data.

Marking: 1 mark for the mean 18; 1 mark for showing the two sides total the same distance (9 each).

12. The original total is 4 x 25 = 100. After adding 40, the total is 140 over 5 numbers, so the new mean is 140 / 5 = 28.

Marking: 1 mark for the original total 100; 1 mark for the new mean 28.

13. Together the children have 2 + 5 + 8 = 15 chocolates. If they pooled and shared them equally, each would get 15 / 3 = 5. The mean, 5, is the equal share each child would have.

Marking: 1 mark for the total and division; 1 mark for interpreting the mean as the equal share.

14. Mean of five matches = (45 + 60 + 30 + 75 + 40) / 5 = 250 / 5 = 50. Since 80 is greater than the current mean, the mean will rise. New total = 250 + 80 = 330, so the new mean = 330 / 6 = 55.

Marking: 1 mark for the mean 50; 1 mark for predicting a rise with a correct reason; 1 mark for the new mean 55.

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15. A line graph suits continuous change over time, such as temperature recorded each hour during a day. A bar graph suits comparing separate categories, such as how many students prefer each sport. A graph can mislead if its axis uses unequal intervals without showing the change, or if an unlabelled truncated axis exaggerates a difference. A clearly labelled non-zero temperature axis is not automatically misleading.

Marking: 1 mark for a fitting line-graph example; 1 mark for a fitting bar-graph example; 1 mark for a valid misleading feature.

## Topic references

NCERT Class 8 Mathematics, Ganita Prakash, Chapter 12: Tales by Dots and Lines.

https://ncert.nic.in/textbook/pdf/hegp205.pdf

Concept reference only. Questions and model answers are original Evater practice material, not an official NCERT paper.

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