Year 9 Statistics – Mixed Practice

ANSWER KEY HappyKids.fit

Answers and worked solutions · 30 questions

A. Mixed practice (mixed order)

1. quantitative, discrete

It is counted, so it can only take separate values

2. 30 students; 21 study exactly one

Total: 11 + 4 + 10 + 5 = 30

Exactly one: 11 + 10 = 21 (not the 4 in the overlap)

3. quantitative, continuous

It is measured, so it can take any value in a range

4. 4 children

Adults, Juice: 54 − 19 − 21 = 14

Children, Juice: 18 − 14 = 4

5. quantitative, continuous

It is measured, so it can take any value in a range

6. 16 children

Adults, Coffee: 49 − 6 − 22 = 21

Children, Coffee: 37 − 21 = 16

7. quantitative, continuous

It is measured, so it can take any value in a range

8. modal class $4 < m \leq 6$; estimated mean 7.36 kg

Midpoints: 3, 5, 7, 9, 11

Sum of midpoint × frequency: $3 \times 6 + 5 \times 14 + 7 \times 6 + 9 \times 13 + 11 \times 11 = 368$

Estimated mean = 368 ÷ 50 = 7.36 kg

Modal class: the highest frequency is 14

9. qualitative, categorical

It is described in words or categories, not numbers

10. Amir must divide by the total frequency, 25, not by the number of classes: 595 ÷ 25 = 23.8.

Error: divided by the number of classes

Total frequency: 3 + 5 + 9 + 8 = 25

595 ÷ 25 = 23.8

11. quantitative, discrete

It is counted, so it can only take separate values

12. **No. Shoe sizes are separate values (such as 5, 5½, 6), so the data is discrete.**

Think of an example or a counter-example
Shoe sizes are separate values (such as 5, 5½, 6), so the data is discrete.
Decide

13. **quantitative, continuous**

It is measured, so it can take any value in a range

14. **23 students; 16 play exactly one**

Total: 11 + 6 + 5 + 1 = 23
Exactly one: 11 + 5 = 16 (not the 6 in the overlap)

15. **a two-way table: it records counts for two categorical variables together.**

Choose: a two-way table
Because it records counts for two categorical variables together

16. **qualitative, categorical**

It is described in words or categories, not numbers

17. **modal class $0 < t \leq 10$; estimated mean 21.4 minutes**

Midpoints: 5, 15, 25, 35, 45
Sum of midpoint × frequency: $5 \times 9 + 15 \times 5 + 25 \times 1 + 35 \times 6 + 45 \times 4 = 535$
Estimated mean = $535 \div 25 = 21.4$ minutes
Modal class: the highest frequency is 9

18. **Team X: median 53, range 29. Team Y: median 60, range 20. Team Y scored more on average; Team Y has the smaller range, so its scores were more consistent.**

Team X: 11 values; median = value 6 = 53; range = 73 − 44 = 29
Team Y: 9 values; median = value 5 = 60; range = 66 − 46 = 20
Compare an average (the median) and the spread (the range), in context

19. **It is misleading because only a chosen time period is shown, which can hide the overall trend.**

Look at the scale, the sample, the pictures and the claim
Problem: only a chosen time period is shown, which can hide the overall trend
A fair version would correct this

20. **Collect how each person travelled (qualitative, categorical). Method: ask people in the town centre at different times and on different days. A large, unbiased sample makes the conclusion more reliable.**

Data: how each person travelled (qualitative, categorical)
Method: ask people in the town centre at different times and on different days
Check the sample is large enough and not biased

21. **30 suitcases; estimated mean 17.5 kg**

Read the frequencies: 5, 7, 5, 9, 4 (total 30)
Midpoints: 7.5, 12.5, 17.5, 22.5, 27.5
Estimated mean = $(7.5 \times 5 + 12.5 \times 7 + 17.5 \times 5 + 22.5 \times 9 + 27.5 \times 4) \div 30 = 17.5$ kg

22. Mar to Apr; percentage change +42.9% (to 1 d.p.), an increase; the overall trend is increasing

Changes: Jan–Feb +10, Feb–Mar +5, Mar–Apr −10, Apr–May +5, May–Jun +5
Biggest fall: Mar to Apr
Percentage change = (50 − 35) ÷ 35 × 100 = ≈ 42.9%

23. 7 girls

Boys, Salad: 41 − 25 − 11 = 5
Girls, Salad: 12 − 5 = 7

24. 33 students; 21 play exactly one

Total: 14 + 9 + 7 + 3 = 33
Exactly one: 14 + 7 = 21 (not the 9 in the overlap)

25. quantitative, discrete

It is counted, so it can only take separate values

26. No. A large sample chosen in a biased way, e.g. only gym members, still misrepresents the population.

Think of an example or a counter-example
A large sample chosen in a biased way, e.g. only gym members, still misrepresents the population.
Decide

27. an infographic: it combines pictures, small charts and short facts that are easy to take in.

Choose: an infographic
Because it combines pictures, small charts and short facts that are easy to take in

28. Feed A: estimated mean 30.5 cm; Feed B: estimated mean 40.75 cm. Feed B gave taller plants on average.

Feed A: (25 × 14 + 35 × 2 + 45 × 3 + 55 × 1) ÷ 20 = 30.5
Feed B: (25 × 7 + 35 × 14 + 45 × 8 + 55 × 11) ÷ 40 = 40.75
The higher estimated mean is Feed B's

29. The 4 people who like both were counted twice: 22 + 20 − 4 = 38 people.

Error: the overlap was counted twice
Only tea: 22 − 4 = 18; only coffee: 20 − 4 = 16
Total: 18 + 4 + 16 = 38

30. Biased: only people who visit the site and choose to vote are included (a self-selected sample). Better: survey a random sample of teenagers directly. Further question: Do teenagers read more in the holidays than in term time?

Who is missed or over-represented? Only people who visit the site and choose to vote are included (a self-selected sample)
Better: survey a random sample of teenagers directly
Further question: Do teenagers read more in the holidays than in term time?