Statistics - Practice test 1

16 questions | 48 marks | 55 minutes

A gradual review of sampling, displays, summaries and evidence-based conclusions.

Equivalent correct methods earn the corresponding marks.

1. Classify each variable as categorical or numerical: favourite subject; journey time in minutes. [2 marks]

Subject names identify categories.

Time measures a numerical quantity.

Answer: Favourite subject: categorical. Journey time: numerical.

2. A school surveys 200 of its 1,200 students. State the population and sample. [2 marks]

The population is the intended full group.

The sample is the observed subgroup.

Answer: Population: all 1,200 students. Sample: the 200 surveyed.

3. Find the mean and mode of 4, 6, 6, 8, 11. [3 marks]

(a) Calculate the mean. [2 marks]

Total 35; divide by 5.

Answer: 7.

(b) State the mode. [1 mark]

6 is most frequent.

Answer: 6.

4. Find the median and range of 16, 18, 20, 20, 22, 24. [3 marks]

(a) Find the median. [2 marks]

Average the middle pair 20 and 20.

Answer: 20.

(b) Find the range. [1 mark]

$24 - 16 = 8$.

Answer: 8.

5. Read the stem-and-leaf plot. Find sample size and largest value. [2 marks]

Key: $3 \mid 1$ means 31 points.

Stem	Leaves
3	1 2 5 6
4	0 0 3

Count seven leaves, including both zeros in stem 4.

The largest stem/leaf is $4 \mid 3$.

Answer: 7 observations; largest 43.

6. A fair sample finds 18 supporters out of 30. Estimate the count among 600 people. [3 marks]

$\frac{18}{30} = 0.6$.

$0.6 \times 600 = 360$, an estimate.

Answer: About 360.

7. A year group has 180 students in A and 120 in B. Allocate a proportional sample of 50. [3 marks]

Total 300.

$\frac{180}{300} \times 50 = 30$; $\frac{120}{300} \times 50 = 20$.

Answer: 30 from A;20 from B.

8. Calculate the mean from the frequency table. [3 marks]

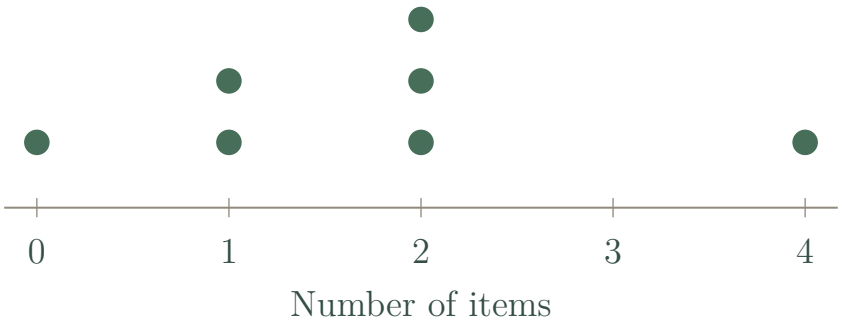
Value	Frequency
1	2
2	3
3	4
4	1

Total frequency 10.

Weighted total $2+6+12+4=24$; $\frac{24}{10}=2.4$.

Answer: 2.4.

9. Draw a dot plot for 0,1,1,2,2,2,4. State the mode. [3 marks]



Use equally spaced numerical positions.

Place one dot per observation; the tallest stack is at 2.

Answer: Stack counts 1,2,3,0,1 at 0-4. Mode 2.

10. Compare median and range: A: 20,22,24,26,28; B: 18,24,24,24,30. [4 marks]

(a) Find each median. [2 marks]

Use the third ordered values.

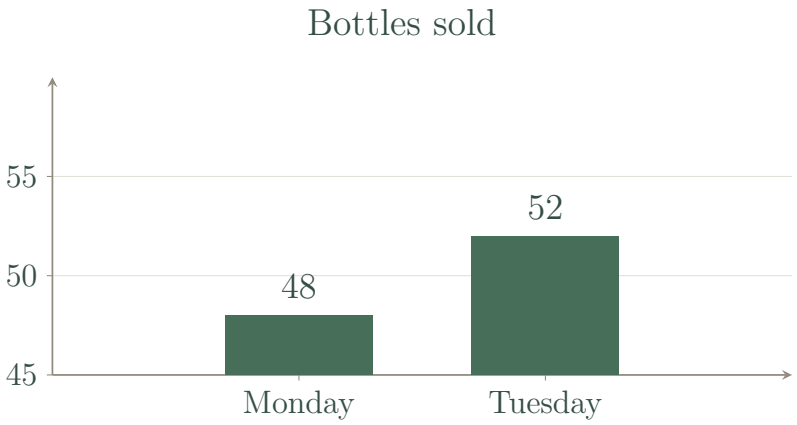
Answer: Both 24.

(b) Find each range and compare spread. [2 marks]

$28-20=8;\ 30-18=12.$

Answer: A 8; B 12. A is less spread out by range.

11. The graph shows 48 and 52 bottles sold. A caption says sales more than doubled. Assess it. [3 marks]



Vertical axis starts at 45, not zero.

$52-48=4.$

$\frac{4}{48}\times 100\approx 8.3\%$;52 is not twice 48.

Answer: False. Sales increased by 4, about 8.3%; the truncated baseline exaggerates visual bar-height differences.

12. Only friends at the gym are surveyed to estimate school-wide interest in exercise. Explain a selection problem and an improvement. [3 marks]

Selection is linked to the question.

A school-wide frame includes students with different interests.

Answer: Gym friends may be more interested in exercise; randomly sample from the school roll.

13. Choose a display for changes in daily library visits across a school week. Explain. [2 marks]

Day belongs on the horizontal axis in order.

Show how the counts change across the week.

Answer: A time-series line graph is suitable; a clearly labelled daily bar chart is also reasonable.

14. For 2,3,3,4,18 find mean and median. Explain their difference. [4 marks]

(a) Find the mean and median. [3 marks]

Total 30, mean 6; third ordered value 3.

Answer: Mean 6; median 3.

(b) Explain their difference. [1 mark]

The mean uses every value directly.

Answer: 18 pulls the mean upward.

15. Fair samples give 52%,59%,55%. Find the range in percentage points and explain why results may differ. [3 marks]

$59 - 52 = 7$.

Different selected people can give different proportions.

Answer: 7 percentage points; ordinary sampling variation is possible.

16. Plan a small investigation comparing Year 9 reading time on weekdays and weekends. State a precise question, a sample method, a display and one limitation. [5 marks]

Define the same measurement for both conditions.

Choose students from a suitable frame.

Compare centre/spread and acknowledge at least one limitation.

Answer: Define minutes per day for this school's Year 9 students; randomly select students; collect comparable weekday/weekend records; use common-scale dot plots; mention self-report or sample-size limits.