IQM3003

LEVEL 3 · CONTROLLED STAFF DOCUMENT

INTO QUALIFICATIONS

Mathematics and Data Handling

Component 2: Data-handling presentation

STAFF ONLY · Moderator and examiner analytical guide

Duration
5–10 minutes for the whole group, including questions

Total marks
100

Assessment window
_____

Assessment set
Set S of 2026

Audience
Staff only

Release timing
at coursework release

STAFF ONLY · Do not release this document to students.

Purpose and use

This controlled guide supports consistent questioning, marking and moderation. It records expected patterns without defining a single correct conclusion. The group analysis pack should address the task's required LO32–LO35 content and may use suitable technique choices from LO36–LO41 as described in the candidate brief; no individual technique is required. Credit valid approaches where supported by appropriate evidence and reasoning.

Scenario synopsis

Riverside College is considering either a bus-service trial or improved walking and cycling facilities. The supplied dataset contains 48 constructed journey records for this assessment. In the scenario, volunteers at the North and South campuses reported one morning journey during the same teaching week. The college has 1,200 students, but the dataset is not a random sample of them. Each row represents one different volunteer. There is no before-and-after intervention evidence. The college wants a justified recommendation about what to investigate or trial next, supported by the data. The task is a decision under incomplete observational evidence, not a search for a predetermined transport policy.

Expected patterns and relationships

Compare medians and IQRs by mode and campus; supplement with means and standard deviations when justified. Suitable graphics include box plots of duration, scatter plots of distance against duration, and grouped frequency displays. Overall correlation can be affected by transport mode and campus; a pooled line should be compared with within-mode patterns. Candidates may calculate Pearson correlation or Spearman rank correlation, with ties handled correctly, and should justify their choice. For regression, define the response and explanatory variable and interpret slope units. The data can support a limited trial or further investigation; it cannot establish that changing mode would cause a specified reduction in lateness.

Numerical checks using all 12 records per mode: duration means are Bus 36.17, Walk 37.42, Cycle 16.75 and Car 17.92 minutes; medians are 36, 38, 18 and 18 minutes respectively. Population standard deviations are 14.95, 9.02, 5.52 and 6.09 minutes. Using medians of the lower and upper halves for quartiles, the duration IQRs are Bus 18.5, Walk 16.5, Cycle 8.5, Car 9 minutes.

Software percentile conventions can produce different quartiles; accept a stated, consistently applied convention.

Pearson correlation between distance and duration is 0.3534 across all 48 journeys; within-mode values are Bus 0.8153, Walk 0.9757, Cycle 0.9267, Car 0.9307.

Removing J13 reduces the Bus duration mean to 32.64 minutes, based on 11 journeys. The recorded lateness denominator is 46, while duration and distance summaries can use all 48. These benchmarks are indicative answers. Candidates must provide evidence for task-required LO32–LO35 content and any selected technique outcomes from LO36–LO41, but may reach alternative valid numerical results where a stated convention or justified method explains the difference.

Data quality, bias and limitations

The 48 records are constructed assessment data, not actual learner records. In the scenario they are a volunteer sample from one week, with equal numbers by campus and mode that do not establish population proportions. Distances and times are reported with rounding. J13 has an unusually long journey; investigate its influence rather than delete it automatically. late_min is missing for J07 and J31; exclude only from calculations needing that field and state the denominator. A real zero remains a valid value. No weather, timetable, congestion or accessibility information is supplied. The timing and cost evidence alone cannot measure safety or the causal effect of a shuttle.

Alternative valid findings

Credit a bus trial, improved walking/cycling facilities, targeted data collection, or a justified decision to defer investment. Evidence and limitations matter more than the recommendation selected. Sensitivity analysis retaining and excluding J13 is valid if both results and the rationale are reported. Rank-based and robust summaries are valid alternatives to Pearson correlation and mean/standard deviation. There is no requirement to use every dataset field. Every technique named as required in the candidate brief must be evidenced; additional valid techniques are optional. Do not award marks for merely reproducing staff benchmark values without demonstrating understanding.

Indicative question bank

Ask at least one question of each candidate and record the candidate, wording and response.

1. Why did you choose this measure of centre and spread?
2. Show how one of your reported statistics was calculated.
3. What does a slope or correlation in your analysis mean, with units and limits?
4. What happens to your conclusion if J13 is retained or excluded?
5. Why is a blank lateness value different from zero?
6. How might volunteer sampling affect your recommendation?
7. How would you draw a stratified random sample of the college?
8. What other factor could explain the relationship you found?
9. What finding would make you change your recommendation?
10. Which part did you produce, and how does it support the conclusion?

Adapt these prompts to the submitted work without teaching or leading the candidate during assessment.