IQM4003

LEVEL 4 · SAMPLE ASSESSMENT

INTO QUALIFICATIONS

Mathematics and Statistics for Business

Applied Data Analysis Project

STAFF ONLY · Staff marking and administration guide

Assessment
IQM4003 A1

Sample set
2026-S

Status
SAMPLE ASSESSMENT

Release timing
at coursework release

Duration
Not time-limited; centre submission deadline applies

Response length
1,500 words ±10%; tables, charts, workings, references and appendices excluded; embed reproducible software workings and labelled chart outputs in the DOCX appendices (no separate spreadsheet is required)

Total marks
40

Weighting
40% of module

AI condition
Level 2 – AI Planning: planning only; do not use AI to generate assessed analysis, interpretation, evaluation, recommendations or final report content.

Administration and delivery

- Issue the same synthetic dataset and units to all candidates; retain each candidate's DOCX workings appendix and embedded chart outputs for authenticity and audit.
- The guide fixes the word range and 40-mark assessment, but not the exact table/chart count; this sample makes those requirements explicit for practice only.
- The centre must complete at least one supervised progress checkpoint; retain evidence of the checkpoint. Any authorship discussion should use neutral questions about the candidate's own analysis.
- Do not allow generated AI analysis or report prose as the candidate's assessed work; planning support only per guide.

Mark scheme and indicative content

1 [10 marks]

Use the self-contained indicative evidence and T1–T6 map below; no withdrawn exemplar is required.

Mark allocation

- Correct descriptive calculations and units 4
- Appropriate correlation/regression method and workings 4
- Relevant business-mathematics/statistical choices 2

Acceptable alternatives

- Accept small rounding differences, but the published task requires sample standard deviation using n−1/STDEV.S. For regression, reward correct method and interpretation from unrounded data; the supplied data yield r about 0.998 and slope about 1.028. For the forecast task, accept a clearly labelled numerical forecast or illustrative estimate only when the horizon, method and assumption are stated, with limitations and later-data validation discussed. Accept a proportionate staffing rule if limitations are explicit.

2 [10 marks]

Use the self-contained indicative evidence and T1–T6 map below; no withdrawn exemplar is required.

Mark allocation

- Data checking/organisation and reproducible workflow 3
- Appropriate labelled visualisations 4
- Transparent software outputs/work file 3

Acceptable alternatives

- Accept small rounding differences, but the published task requires sample standard deviation using n−1/STDEV.S. For regression, reward correct method and interpretation from unrounded data; the supplied data yield r about 0.998 and slope about 1.028. For the forecast task, accept a clearly labelled numerical forecast or illustrative estimate only when the horizon, method and assumption are stated, with limitations and later-data validation discussed. Accept a proportionate staffing rule if limitations are explicit.

3 [10 marks]

Use the self-contained indicative evidence and T1–T6 map below; no withdrawn exemplar is required.

Mark allocation

- Interpretation of descriptive patterns and relationship 4
- Causal/forecast caution and limitations 4
- Proportionate recommendation/ethical point 2

Acceptable alternatives

- Accept small rounding differences, but the published task requires sample standard deviation using n−1/STDEV.S. For regression, reward correct method and interpretation from unrounded data; the supplied data yield r about 0.998 and slope about 1.028. For the forecast task, accept a clearly labelled numerical forecast or illustrative estimate only when the horizon, method and assumption are stated, with limitations and later-data validation discussed. Accept a proportionate staffing rule if limitations are explicit.

4 [10 marks]

Use the self-contained indicative evidence and T1–T6 map below; no withdrawn exemplar is required.

Mark allocation

- Clear research question, structure and terminology 3
- Tables/charts integrated and legible 3
- Conclusions, evidence and concise professional writing 4

Acceptable alternatives

- Accept small rounding differences, but the published task requires sample standard deviation using n−1/STDEV.S. For regression, reward correct method and interpretation from unrounded data; the supplied data yield r about 0.998 and slope about 1.028. For the forecast task, accept a clearly labelled numerical forecast or illustrative estimate only when the horizon, method and assumption are stated, with limitations and later-data validation discussed. Accept a proportionate staffing rule if limitations are explicit.

Self-contained indicative evidence and requirement map

Reference calculations from the supplied 12-row dataset: visits mean 466.7 transactions, median 465, range 150, sample standard deviation 45.6; revenue mean 574.8 (£ hundreds), median 570, range 155 (£ hundreds), sample standard deviation 47.0 (£ hundreds). Accept small rounding differences when the method and units are clear.

- Correlation/regression evidence: Pearson r ≈ 0.998; revenue-on-visits least-squares slope ≈ 1.028 £ hundreds per visit and intercept ≈ 95.17 £ hundreds. Require interpretation as association, with the zero-visits intercept treated as outside the observed range and not practically meaningful.
- Chart evidence: Chart 1 should be a labelled scatter plot with weekly customer visits (transactions) on x and weekly revenue (£ hundreds) on y; a fitted trend line may be included if legible. Chart 2 should be a labelled period/time-sequence chart with visits and revenue clearly distinguished, preferably in separate panels or axes because the units differ. Both charts must be embedded in the candidate DOCX appendix with reproducible outputs.
- Forecast evidence: accept a cautious numerical forecast or illustrative estimate for a stated horizon and explicit assumption. An indicative conditional period-13 estimate is 660.4855 revenue (£ hundreds), approximately £66,049, if 550 visits are assumed and the fitted line is used: 95.1735 + 1.02784 × 550 = 660.4855. This is not evidence that future demand will be 550 visits; require a stated method, uncertainty/limitations and validation against later data.

- Interpretation and ethics evidence: candidates should distinguish association from causation, recognise the small sequential sample and missing drivers, avoid claiming forecast accuracy from the fitted points, and make a proportionate staffing recommendation. Aggregate weekly totals have low immediate privacy exposure; any later linked loyalty or employee data require purpose limitation, minimisation, access controls and fair use.

Requirement-to-criterion map for consistent marking: T1 → AO4/criterion 4 (research question, aim, objectives and structure); T2 → AO2/criterion 2 (data checking, organisation and limitation); T3 → AO1/criterion 1 (descriptive calculations) plus AO2/criterion 2 (reproducible outputs); T4 → AO1, AO2, AO3 and AO4 through regression, scatter visualisation, interpretation and communication; T5 → AO1 (forecast method), AO2 (time-sequence visualisation), AO3 (forecast reliability and validation) and AO4 (integrated chart and explanation); T6 → AO3 (recommendation and ethics) plus AO4 (evidence-based conclusion). Do not award the same evidence twice within a criterion.

The four 10-mark criteria remain: AO1 descriptive calculations 4 + correlation/regression 4 + relevant statistical choices including forecast method 2; AO2 data checking/workflow 3 + labelled visualisations 4 + transparent outputs 3; AO3 interpretation 4 + causal/forecast caution and limitations 4 + recommendation/ethics 2; AO4 question/structure 3 + integrated tables/charts 3 + conclusions/evidence/professional writing 4.

Assessment rubric

criterion	marks	allocation
Application of Quantitative Techniques (AO1, LO1)	10	Correct descriptive calculations and units — 4 Appropriate correlation/regression method and workings — 4 Relevant business-mathematics/statistical choices, including forecast method — 2
Use of Digital Tools and Data Handling (AO2, LO2)	10	Data checking/organisation and reproducible workflow — 3 Appropriate labelled visualisations — 4 Transparent software outputs/work file — 3
Interpretation and Evaluation (AO3, LO3)	10	Interpretation of descriptive patterns and relationship — 4 Causal/forecast caution and limitations — 4 Proportionate recommendation/ethical point — 2
Communication and Presentation (AO4, LO4)	10	Clear research question, structure and terminology — 3 Tables/charts integrated and legible — 3 Conclusions, evidence and concise professional writing — 4

Standardisation guidance

- Apply consequential credit only where the specified scheme permits; do not double-penalise carried-forward arithmetic errors.
- Accept equivalent valid analytical approaches and properly justified conclusions.
- Check criterion/subquestion totals equal the published total before use.