IQM4003

LEVEL 4 · SAMPLE ASSESSMENT

INTO QUALIFICATIONS

Mathematics and Statistics for Business

Final Examination

STAFF ONLY · Staff marking and administration guide

Assessment
IQM4003 A2

Sample set
2026-S

Status
SAMPLE ASSESSMENT

Release timing
exam release

Duration
2 hours

Response length
Not applicable

Total marks
60

Weighting
60% of module

AI condition
Level 1 – Controlled Assessment: no AI permitted at any stage.

Administration and delivery

- Securely invigilate the two-hour examination. Students answer all questions in the candidate pack. Provide an answer booklet under centre procedures.
- The paper is closed-book and no additional materials are permitted. A non-programmable, non-graphing scientific calculator is required. Calculators with CAS, text, image, document storage or internet capability, and phones, tablets and smart watches, are not permitted.
- Accessibility arrangements must follow programme policy and preserve the assessment construct. Record any approved arrangement through centre procedures.

Assessment alignment and mark structure

- The candidate paper assesses LO1, LO3 and LO4 and totals 60 marks: Section A multiple-choice Q1–Q3 is 6 marks (2 each); Section B short-answer Q4–Q7 is 24 marks (6 each); Section C extended-response Q8–Q9 is 30 marks (15 each). Students answer all questions.

Mark scheme and indicative content

Q1 [2 marks]

Correct answer: C, £22,000. Award 2 marks only for selecting C; award 0 marks for any other or blank selection. Working is not required and cannot earn marks without the correct selected option.

Q2 [2 marks]

Correct answer: B, Median. Award 2 marks only for selecting B; award 0 marks for any other or blank selection. Reasoning is not required and cannot earn marks without the correct selected option.

Q3 [2 marks]

Correct answer: C, strong negative linear association. Award 2 marks only for selecting C; award 0 marks for any other or blank selection. Reasoning is not required and cannot earn marks without the correct selected option.

Q4 [6 marks]

Expected answer: £48,000 × 1.075 × 0.96 = £49,536. Net change = £1,536; £1,536 ÷ £48,000 × 100 = 3.2%. The percentages apply sequentially to different bases, so they cannot simply be added.

Mark allocation

- Sequential calculation and final revenue 2; net percentage change 2; explanation of changing bases 2.

Q5 [6 marks]

Expected answer: mean = (18+20+17+25+30) ÷ 5 = 22; ordered values 17, 18, 20, 25, 30 give median 20; range = 30−17 = 13. Median is the most suitable choice because it is less affected by an unusually high observation.

Mark allocation

- Mean and working 2; median 1; range 1; robust-statistic choice and reason 2.

Q6 [6 marks]

Expected answer: A = 12,000(1.05)^3 = £13,891.50; interest = £13,891.50 − £12,000 = £1,891.50.

Mark allocation

- Formula and setup 2; final amount 2; interest 1; currency and rounding 1.

Q7 [6 marks]

Expected answer: absolute error = |1,250−1,100| = 150 orders; absolute percentage error = 150 ÷ 1,100 × 100 = 13.6%. Relevant checks include performance on holdout periods, changing seasonality or conditions, data quality and model assumptions; award credit for any two explained checks.

Mark allocation

- Absolute error 2; percentage error method and value 2; two relevant explained checks 2.

Q8 [15 marks]

Expected evidence: $\hat{y} = 24 + 2.8(5) = £38,000$. The slope means each additional £1,000 of advertising spend is associated with £2,800 higher predicted weekly sales within the model. $r = 0.76$ indicates a positive fairly strong linear association. Correlation does not prove causation because confounding factors, non-random spending or reverse causation may be present. A further check could be a holdout-period test, controlled trial or cost-benefit analysis.

Level guidance and mark allocation

- Level 3 (12–15): accurate prediction, contextual slope and correlation interpretation, evaluated causal limitation, and justified further check or decision. Level 2 (7–11): mostly accurate calculation and interpretation with partial evaluation. Level 1 (1–6): limited calculation or mainly unsupported statements. No credit (0): no relevant response. Within the level, use prediction 3, slope 3, correlation 3, causal evaluation 3 and further check/justification 3 as evidence.

Q9 [15 marks]

Expected evidence: Q1 index 92 means Q1 sales are 92% of the average-quarterly reference. Q4 = 106% × £250,000 = £265,000. The pattern supports planning for seasonal variation rather than identical staffing throughout the year, while recognising that four index values do not establish a full forecast. A limitation could be the absence of several years of data, unexpected future conditions or the assumption that the index reference is stable.

Level guidance and mark allocation

- Level 3 (12–15): accurate index interpretation and calculation, evidence-based staffing recommendation, and a relevant limitation evaluated. Level 2 (7–11): mostly accurate calculation and recommendation with partial use of evidence or limitation. Level 1 (1–6): limited calculation or unsupported recommendation. No credit (0): no relevant response. Within the level, use index meaning 3, calculation 3, seasonal interpretation 4, recommendation 3 and limitation 2 as evidence.

Standardisation guidance

- Apply consequential credit where a correct method is followed by an arithmetic slip. Accept equivalent expressions, sensible rounding and valid contextual wording. Do not double-penalise a carried-forward error.
- For Q8 and Q9, use the level guidance and best-fit judgement; the listed point allocations are evidence prompts, not a requirement that every phrase is reproduced verbatim.
- Before use, check that criterion and subquestion totals equal the published 60 marks and that the candidate and staff question IDs and wording match.