NT NEURATECH ACADEMY

MOCK EXAMINATION — SET 1 OF 5

MOCK RESULT

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Examination Result Report

Mathematics — Paper 3 Pure Mathematics 3 · Code 9709/31

CAMBRIDGE INTERNATIONAL A LEVEL · PURE MATHEMATICS 3 (P3) — STRUCTURED QUESTIONS

STUDENT NAME	STUDENT ID	CENTRE	EXAM DATE	DURATION
[redacted]	[redacted]	BD 115	25th April 2026	1 hour 50 minutes

TOTAL SCORE

73/75

97.3% Overall

INDICATIVE GRADE

A*

Excellent (85–100%)

PERFORMANCE BAND

Excellent

8 of 10 questions perfect

PERFORMANCE BY QUESTION

10 QUESTIONS · 75 MARKS TOTAL

Q1	4/4 (100%)
Q2	5/5 (100%)
Q3	5/6 (83.3%)
Q4	7/7 (100%)
Q5	7/7 (100%)
Q6	8/8 (100%)
Q7	8/8 (100%)
Q8	8/8 (100%)
Q9	8/9 (88.9%)
Q10	13/13 (100%)

DETAILED MARK BREAKDOWN

PER-QUESTION · PER-PART

Q	TOPIC / SKILL	EARNED	MAX	SCORE	STATUS
Q1	Integration by Parts — $\int_1^2 x\ln(2x)\,dx$	4	4	100%	● Full
Q2	Modulus Function — Sketch & Solve $\lvert 3x - 2 \rvert < x + 4$ 2(a) 1/1 · 2(b) 4/4	5	5	100%	● Full
Q3	Logarithmic Equations — $\log_9(2x+1) = 2\log_9(x+1) - 1$ 3(a) 3/3 · 3(b) 2/3	5	6	83.3%	● Partial
Q4	Trig — R·cos(θ − α) Form & Solve $3\cos 2x + 4\sin 2x = -4$ 4(a) 3/3 · 4(b) 4/4	7	7	100%	● Full
Q5	Argand Locus & Least arg(z) for $\lvert z - (3+4i) \rvert = 5$ 5(a) 2/2 · 5(b) 5/5	7	7	100%	● Full
Q6	Parametric Differentiation & Normal Equation 6(a) 4/4 · 6(b) 4/4	8	8	100%	● Full
Q7	Iterative Methods — $x^3 + 2x - 7 = 0$ 7(a) 1/1 · 7(b) 2/2 · 7(c) 2/2 · 7(d) 3/3	8	8	100%	● Full
Q8	Partial Fractions + Maclaurin Expansion + Validity Range 8(a) 3/3 · 8(b) 3/3 · 8(c) 2/2	8	8	100%	● Full
Q9	Vectors 3D — Line Equation, Intersection, Foot of Perpendicular 9(a) 2/2 · 9(b) 2/3 · 9(c) 4/4	8	9	88.9%	● Partial
Q10	Differential Equation — Tank Inflow/Outflow Model 10(a) 3/3 · 10(b) 3/3 · 10(c) 4/4 · 10(d) 3/3	13	13	100%	● Full
Total	**All Questions**	**73**	**75**	**97.3%**	**Grade A***

Q1 Integration by Parts — $\int_1^2 x \ln(2x)\,dx$ 4/4 · 100%

Q1 [4/4]

Full marks

M1 A1 M1 A1

Used the "ILATE" mnemonic correctly to choose u = ln(2x) and dv = x dx (the right way around). Computed du = (1/x) dx and v = $x^2/2$. Applied the by-parts formula cleanly: $[(x^2/2)\cdot\ln(2x)]_1^2 - \int_1^2 (x/2)\,dx$ = (2 ln 4 − (1/2) ln 2) − (1 − 1/4) = **(7/2) ln 2 − 3/4**, equivalently **−3/4 + (7/2) ln 2**. ✓

Examiner reconciliation (QP error): the question demands "your answer in the form a + b ln 2, where a and b are integers", but the actual integral evaluates to −3/4 + (7/2) ln 2 — i.e. a = −3/4 (not integer) and b = 7/2 (not integer). The QP's integer constraint is mathematically impossible to satisfy at these limits. The candidate's answer is the verifiably correct exact value. Full credit awarded under positive marking.

Q2 Modulus Function — Sketch & Solve |3x − 2| < x + 4 5/5 · 100%

2(a) [1/1]

Full marks

B1

V-shaped graph drawn correctly with vertex at (2/3, 0) on the x-axis and y-intercept at (0, 2). ✓

2(b) [4/4]

Full marks

M1 M1 A1 A1

Two-case analysis: **+(3x−2) < x+4** ⇒ 2x < 6 ⇒ x < 3; **−(3x−2) < x+4** ⇒ −4x < 2 ⇒ x > −1/2. Combined with sketch: **−1/2 < x < 3**. Both critical values found and strict inequality preserved. ✓

Q3 Logarithmic Equation — $\log_9(2x+1) = 2\log_9(x+1) - 1$ 5/6 · 83.3%

3(a) [3/3]

Full marks

M1 A1 A1

Used the log power law ($2\log_9(x+1) = \log_9(x+1)^2$) and the $-1 = \log_9 9$ step cleanly. Arrived at $2x+1 = (x+1)^2/9$ (AG). Cross-multiplied $9(2x+1) = (x+1)^2$ and expanded to **$x^2 - 16x - 8 = 0$**. ✓

3(b) [2/3]

Partial credit

M1 DM1 A0

Quadratic formula applied correctly: x = (16 ± √288)/2 = **8 ± 6√2**. ✗ But the candidate stated BOTH roots as the answer without rejecting **x = 8 − 6√2 ≈ −0.485**, which violates the domain requirements (it makes 2x+1 = −0.97 < 0, invalid for $\log_9$). The question explicitly says "rejecting any solutions that do not satisfy the domain requirements". M1 + DM1 awarded for the formula and surd simplification; A1 lost for failing to reject the negative root. **Mark cost: 1.**

Q4 Trig — R·cos(θ − α) Form & Solve 3cos 2x + 4sin 2x = −4 7/7 · 100%

4(a) [3/3]
Full marks
B1 M1 A1

$R = \sqrt{3^2 + 4^2} = $ **5**; $\tan\alpha = 4/3 \Rightarrow$ **$\alpha = 0.9273$ rad (4 d.p.)**. Final harmonic form: $5\cos(\theta - 0.9273)$. ✓

4(b) [4/4]
Full marks
M1 A1 M1 A1

$5\cos(2x - 0.9273) = -4 \Rightarrow \cos(2x - 0.9273) = -4/5$. Reference angle = 0.6435 rad. Within $0 < 2x < 2\pi$: $2x - 0.9273 = 2.498$ or 3.785, giving **$x = 1.71$ rad and $x = 2.36$ rad**. Both solutions in range. ✓

Q5 Argand Locus & Least arg(z) for |z − (3+4i)| = 5 7/7 · 100%

5(a) [2/2]
Full marks
B1 B1

Circle drawn on the Argand diagram, centred at (3, 4), radius 5 — passing through the origin (since $|OW| = \sqrt{25} = 5$ = radius). ✓

5(b) [5/5]
Full marks
M1 M1 A1 M1 A1

Recognised that the origin lies on the circle, hence the tangent at O perpendicular to the radius (3+4i) determines the extreme arg(z). Computed: **least $\arg(z) = -(\pi/2 - \arctan(4/3)) = -0.6435$ rad ≈ -0.644 rad**. ✓

> **Examiner reconciliation:** the published mark scheme states "arg(z) = 0 (since tangent at O is along real axis)" — but the tangent at the origin is perpendicular to the radius from O to (3,4), giving slope −3/4, not 0. Independent verification (sampling 100,000 points on the circle) confirms **min arg(z) = −0.6435 rad**, not 0. The candidate's answer is mathematically correct; the mark scheme contains an error. Full credit awarded under positive marking.

Q6 Parametric Differentiation & Normal Equation 8/8 · 100%

6(a) [4/4]
Full marks
M1 A1 M1 A1

$dx/dt = 2t + 1$; $dy/dt = 3t^2 - 3$. Chain rule: $dy/dx = (dy/dt)/(dx/dt) =$ **$(3t^2 - 3)/(2t + 1)$** as required (AG). ✓

6(b) [4/4]
Full marks
M1 A1 M1 A1

At $t = 2$: point (6, 2), tangent gradient 9/5, normal gradient **−5/9**. Normal: $y - 2 = (-5/9)(x - 6) \Rightarrow$ multiplied through to integer form: **$5x + 9y = 48$**. ✓

Q7 Iterative Methods — $x^3 + 2x - 7 = 0$ 8/8 · 100%

7(a) [1/1]
Full marks
B1

Sketched $y = x^3$ (cubic) and $y = 7 - 2x$ (decreasing line) on the same axes — one intersection visible. ✓

7(b) [2/2]
Full marks
M1 A1

$f(1) = 1 + 2 - 7 = \mathbf{-4} < 0$; $f(2) = 8 + 4 - 7 = \mathbf{5} > 0$. Sign change established ⇒ root in (1, 2). ✓

7(c) [2/2]
Full marks
B1 B1

From $x^3 + 2x - 7 = 0$, rearranged $2x = 7 - x^3 \Rightarrow x = (7 - x^3)/2$; if $x_n \to \alpha$, then α satisfies the original equation. ✓

7(d) [3/3]
Full marks
M1 A1 A1

Insight: the prescribed iteration $x_{n+1} = (7 - x_n^3)/2$ diverges from $x_0 = 1.5$ (oscillates). The candidate switched to the convergent rearrangement $\mathbf{x_{n+1} = (7 - 2x_n)^{1/3}}$ and produced iterations 1.56393, 1.57030, 1.56858, 1.56905, 1.56692, 1.56895 — converging to **α = 1.569 (3 d.p.)**. ✓ A mature mathematical move — recognising that the textbook formula doesn't converge from the given start and selecting an equivalent convergent iteration.

Q8 Partial Fractions + Maclaurin Expansion + Validity Range 8/8 · 100%

8(a) [3/3]
Full marks
M1 A1 A1

Correct decomposition form $A/(x+2) + (Bx+C)/(x^2+3)$. Cover-up at $x = -2$: $24 = 7A \Rightarrow$ **A = 24/7**. Substitution at $x = 0$: $6 = 3A + 2C \Rightarrow$ **C = −15/7**. Substitution at $x = 1$: $12 = (24/7)(4) + (B - 15/7)(3) \Rightarrow$ **B = 11/7**. ✓

> **Examiner reconciliation:** the mark scheme's stated “A=4, B=1, C=−1” verifiably gives $4(x^2+3) + (x-1)(x+2) = 5x^2 + x + 10$ — off by 4 from the actual numerator $5x^2 + x + 6$. The MS itself acknowledges “this doesn't match”. The candidate's **A = 24/7, B = 11/7, C = −15/7** is the correct decomposition (verified programmatically with SymPy). Full credit awarded.

8(b) [3/3]
Full marks
M1 A1 A1

Binomial expanded each fraction up to x^2: $(12/7)(1 - x/2 + x^2/4) + ((11x/21) - (15/21))(1 - x^2/3)$. Combined: $\mathbf{1 - x/3 + (2/3)x^2}$. Independently verified against the direct Maclaurin series of f(x) — exact match. ✓

8(c) [2/2]
Full marks
B1 B1

From the two binomial conditions: $|x/2| < 1$ (giving $|x| < 2$) and $|x^2/3| < 1$ (giving $|x| < \sqrt{3}$). Selected the more restrictive: $\mathbf{|x| < \sqrt{3}}$. ✓

Q9 Vectors 3D — Line Equation, "Intersection", Foot of Perpendicular

8/9 · 88.9%

9(a) [2/2]

Full marks

B1 B1

l: r = (1, −2, 3) + λ(2, 1, −2). Equivalent column form and i, j, k form both shown. ✓

9(b) [2/3]

Partial credit

M1 A1 A0

Set up l = m and solved equations 1+2 to get λ = 7/5, μ = 4/5. ✗ But the candidate's check of the third equation incorrectly stated "1/5 = 1/5" — the actual values are LHS = 1/5 and RHS = 3/5, which do not match. Hence the lines do NOT intersect (they are skew). M1 + A1 awarded for the method and parameters from two equations; A1 lost for the false equality claim and consequent erroneous "intersection point". **Mark cost: 1.**

> **Reconciliation note (QP error):** the question presupposes an intersection, but the lines as defined are SKEW (verified programmatically). The candidate's stated point (19/5, −3/5, 1/5) lies on line l only, not line m. Whilst the QP itself is broken, the candidate's failure to surface the inconsistency cost the final accuracy mark.

9(c) [4/4]

Full marks

M1 M1 DM1 A1

General point on l, BX = (2λ−2, λ−3, 4−2λ), perpendicular condition BX·d = 0 ⇒ 9λ = 15 ⇒ **λ = 5/3**. Foot of perpendicular: **OX = (13/3, −1/3, −1/3)**. ✓

Q10 Differential Equation — Tank Inflow/Outflow Model

13/13 · 100%

10(a) [3/3]

Full marks

B1 M1 A1

Identified inflow rate (5 L/min) and outflow rate (kV with k = 0.02). Net rate: **dV/dt = 5 − 0.02V** (AG). ✓

10(b) [3/3]

Full marks

B1 M1 A1

Set 5 = A(5 − 0.02V) + B. Cover-up at V = 250 (5−0.02V = 0): 5 = B ⇒ **B = 5**. Comparison of V-coefficients: **A = 0**. Recognised that 5/(5−0.02V) is already in the requested trivial form. ✓

10(c) [4/4]

Full marks

M1 DM1 A1 A1

Separated ∫ (1/(5−0.02V)) dV = ∫ dt and integrated with the −1/0.02 = −50 factor: −50 ln|5−0.02V| = t + c. Used initial condition V = 100 at t = 0: c = −50 ln 3. Manipulated to **$V = 250 - 150e^{-t/50}$** (equivalent to MS's $250 - 150e^{-0.02t}$). ✓ Excellent final-form discipline — carrying the Set 3 Priority-2 lesson into a third paper.

10(d) [3/3]

Full marks

M1 DM1 A1

$200 = 250 - 150e^{-t/50} \Rightarrow e^{-t/50} = 1/3 \Rightarrow t = -50\ln(1/3) = 50\ln 3 \approx$ **54.9 minutes** (1 d.p.). ✓

REPORT COLOUR KEY

- Correct / Full
- Partial Credit
- Error / Loss
- Advisory
- Tip / Suggestion

★ PERFORMANCE OVERVIEW

SENIOR EXAMINER NARRATIVE

TAQBIR has produced an **outstanding A*-level performance**, scoring **73 out of 75 (97.3%)** on this Pure Mathematics 3 Mock Set 1 (9709/31) — this is the **strongest of the three papers marked to date** and places him firmly at the top of the A* band. Eight of the ten questions earned full marks, including the toughest 13-mark differential-equation question (Q10) which was completed without losing a single mark. **Three mark-scheme/QP errors were reconciled in his favour** — Q1 (the QP demanded integers a, b for an integral whose true value is −3/4 + (7/2) ln 2, neither integer); Q5(b) (the MS stated "arg(z) = 0" but the verifiable least arg(z) is −0.6435); Q8(a) (the MS's stated A = 4, B = 1, C = −1 gives the wrong numerator). Each was verified programmatically before the reconciliation was applied. Just 2 marks were lost across two sub-parts: one for failing to reject the negative root in Q3(b)'s log equation, and one for not noticing the Q9 lines are actually skew (a QP error compounded by an arithmetic slip in checking the third equation).

Most importantly: the differential-equation discipline lesson from Set 3 ("always take the final algebraic step") is now fully internalised — Q10(c) goes all the way to $V = 250 - 150e^{-t/50}$, a textbook complete answer. And the Set 2 vectors-with-planes gap is irrelevant on this paper (no plane question was asked), but the line/perpendicular machinery in Q9(a)(c) was clean. The trajectory across three sets is unmistakably positive.

✓ STRENGTHS DEMONSTRATED

5 CORE COMPETENCIES

✓ Differential Equations — Top-Decile Mastery 13/13

Q10 (13/13) — the toughest question on the paper, the entire chain executed without a slip:

- Identified the rates and set up $dV/dt = 5 - 0.02V$ cleanly.
- Trivial decomposition for partial fractions handled correctly (A = 0, B = 5).
- Separation, integration with the −50 factor, and isolation of V to give $\mathbf{V = 250 - 150e^{-t/50}}$.
- Inverted to find t when V = 200: $t = 50 \ln 3 \approx 54.9$ minutes.

✓ Iterative Methods — Mathematical Maturity 8/8

Q7 (8/8) — the candidate noticed that the textbook iteration $x_{n+1} = (7 - x_n^3)/2$ actually *diverges* from $x_0 = 1.5$ and switched to the equivalent convergent form $x_{n+1} = (7 - 2x_n)^{1/3}$. This is exactly the kind of independent judgement examiners look for — recognising that a prescribed formula has practical issues and selecting a mathematically-equivalent alternative. Final answer α = 1.569 (3 d.p.) was correctly obtained.

✓ Partial Fractions + Maclaurin Expansion — 8/8

Q8 (8/8) — the partial-fraction decomposition gave A = 24/7, B = 11/7, C = −15/7 (the actually correct values; the mark scheme's stated values were verifiably wrong). The Maclaurin expansion combined the two binomial expansions cleanly to **$1 - x/3 + (2/3)x^2$**, which the agent independently verified against the direct series of f(x). The validity range $|x| < \sqrt{3}$ was correctly chosen as the more restrictive condition.

✓ Independent Verification — Three Reconciliations — RECONCILED ×3

On **three separate sub-parts** the candidate's answer was verifiably more correct than the published mark scheme:

- **Q1:** $-3/4 + (7/2)\ln 2$ — the actual integral value (a, b cannot be integers as the QP demands; QP error).
- **Q5(b):** −0.644 rad — the actual least arg(z) (verified by sampling 100,000 points; MS's "0" is wrong).
- **Q8(a):** A = 24/7, B = 11/7, C = −15/7 — the verifiably correct partial fractions (MS's A = 4, B = 1, C = −1 gives the wrong numerator).

Across all three papers in this series, the candidate has now reconciled **EIGHT** mark-scheme/QP errors in his favour — a hallmark of operating well above standard scheme calibration.

✓ Modulus, Trig & Argand Geometry — All Full — 19/19

Q2 + Q4 + Q5 (19/19) — modulus inequality solved with both critical values found and combined correctly; $R\cdot\cos(\theta-\alpha)$ form derived cleanly with both x = 1.71 and x = 2.36 in the range; least-arg-z geometry recognised correctly with the origin-on-circle insight.

⚠ AREAS OF WEAKNESS — REQUIRING ATTENTION

2 THEMES · 2 MARKS LOST

! Domain Validation — Q3(b) Negative Root Not Rejected — −1 MARK

The candidate correctly derived $x = 8 \pm 6\sqrt{2}$ from the quadratic but stated BOTH roots as the answer. The negative root $x = 8 - 6\sqrt{2} \approx -0.485$ makes $2x+1 \approx -0.97 < 0$ — invalid for $\log_9(2x+1)$. The question explicitly asks to "reject any solutions that do not satisfy the domain requirements". Always check whether each root satisfies the original log domain before stating the final answer.

! Three-Equation Verification — Q9(b) False Equality Claimed — −1 MARK

After solving the first two of three equations ($\lambda = 7/5$, $\mu = 4/5$), the candidate checked the third and incorrectly stated "1/5 = 1/5". The actual LHS = 1/5 and RHS = 3/5 are not equal — meaning the lines are SKEW (no intersection). The QP itself has an error here, but the candidate's failure to compute the third equation accurately let the inconsistency through. Always compute both sides of any consistency check exactly — if the QP setup is broken, surfacing the discrepancy itself can earn marks.

⚑ TARGETED IMPROVEMENT ADVICE

5 PRIORITIES · RANKED

PRIORITY 1

1 Always Check Domain When Solving Log/Sqrt Equations — Q3(B)

For any $\log_b$(expression) equation, after solving the resulting algebra, substitute each candidate root back and check that EVERY argument is > 0. Same applies to √(expression) (must be ≥ 0) and division (denominator ≠ 0). A useful template:

- Find candidate roots from the quadratic / cubic.
- For each root, substitute into every log argument in the original equation.
- Reject any root that makes any argument ≤ 0.
- State the rejection explicitly: "x = 8 − 6√2 rejected because 2x+1 < 0".

PRIORITY
2

2 Verify the Third Equation Exactly — Always Compute Both Sides Q9(B)

When solving 3D-vector intersection problems, after solving the first two scalar equations for λ and μ, the third equation is a CONSISTENCY CHECK. Compute the LHS and RHS as separate numerical values and explicitly compare. Never write "LHS = RHS" without the actual values. If the values disagree, the lines are skew and the QP question may be broken — flag it; this in itself can earn a mark.

PRIORITY
3

3 Continue the Convergent-Iteration Habit Q7(D)

The Q7(d) move — recognising the prescribed formula diverges from x_0 = 1.5 and selecting an equivalent convergent rearrangement — was a top-decile insight. Keep this habit. For any iteration question, compute 2–3 iterations early; if they oscillate or grow, refactor the formula to an equivalent convergent form (e.g. cube-root, log, or implicit-form rearrangement).

PRIORITY
4

4 Remember Vectors-with-Planes for Future Variants CARRYOVER

Set 1 (this paper) had vectors-with-LINES only (Q9). Set 2 had vectors-with-PLANES which was incorrectly skipped due to the "not in syllabus" misconception. The Priority-1 advice from the Set 2 report still stands: drill plane-equation, line-meets-plane, line-plane angle, and point-to-plane distance. The next variant may include planes; be ready.

PRIORITY
5

5 Continue the Mark-Scheme Verification Instinct KEEP

Across three papers, the candidate's answers have been verifiably more correct than the published mark scheme on **EIGHT** separate sub-parts (this paper: Q1, Q5b, Q8a; Set 2: Q1, Q5c, Q8c; Set 3: Q2b, Q8b). This is exceptional. Continue computing the substitution check on every numerical final answer — it has caught real errors and earned full credit on every occasion.

"

TEACHER'S COMMENT

TAQBIR has produced an **exceptional, top-decile A* performance** on this Pure Mathematics 3 mock paper, scoring **73 out of 75 (97.3%)** — the strongest of the three papers in this mock series and a marked improvement on Set 2's 81.3%. Eight of the ten questions earned full marks, INCLUDING the substantial 13-mark Q10 (Newton's-cooling-style differential equation), which was carried all the way through to $V = 250 - 150\,e^{-t/50}$ and t = 54.9 minutes — a complete A*-grade execution that proves the "always take the final algebraic step" lesson from Set 3 has been fully absorbed. Q7(d) is particularly noteworthy: the candidate independently recognised that the prescribed iteration $(7 - x^3)/2$ diverges and switched to the equivalent convergent form $(7 - 2x)^{1/3}$ — a move that distinguishes top candidates from average ones.

Across the three papers marked, TAQBIR has now found **eight verifiable errors in the published mark schemes/question papers** (this paper alone: Q1, Q5b, Q8a). Each was confirmed programmatically before being reconciled in his favour under positive marking. This is the hallmark of a candidate operating well above standard scheme calibration. Only 2 marks were lost on this paper: one for failing to reject the negative root in Q3(b)'s log equation (a domain-validation discipline gap), and one for not surfacing the Q9 skew-lines QP error (an arithmetic-check slip). Both are genuinely small process issues, easily fixable.

The three-paper trajectory is now clear: 81.3% → 96.0% → 97.3%. If the final two variants are answered with the same discipline shown here, plus the vectors-with-planes recovery from the Set 2 advice, TAQBIR is positioned for a confident 75/75 on the live 9709/3X paper. Outstanding work.

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PERFORMANCE TREND TRACKER

3-SET CROSS-PAPER COMPARISON

PAPER	VARIANT & FOCUS	SCORE	PERCENT	GRADE	VISUAL
Set 2	9709/32 — Calc + ODE + vectors w/ PLANES (skipped)	**61/75**	81.3%	A	
Set 3	9709/33 — Mechanics-leaning P3 mix	**72/75**	96.0%	A*	
Set 1	9709/31 — ODE + iteration + complex + lines (no planes)	**73/75**	97.3%	A*	

Trend Analysis — Set 1 is the strongest of the three papers

The three-paper trajectory shows steady absorption of feedback: **81.3%** → **96.0%** → **97.3%**. Critically, the differential-equation discipline lesson from Set 3 (“always take the final algebraic step”) is now fully internalised — Q10 on Set 1 was completed without a single mark lost. The vectors-with-planes gap exposed in Set 2 didn't appear on Set 1 (no plane question), but the vectors-with-LINES machinery (Q9) was clean. **Eight verifiable mark-scheme errors have now been reconciled across the three papers** in the candidate's favour — an exceptional habit.

QUESTION CATEGORY	SET 2	SET 3	SET 1	DELTA
Differential Equations / ODEs	**9/9**	**5/6**	**13/13**	**+ peak mastery**
Integration (parts / substitution)	**7/7**	**7/7**	**4/4**	stable — full marks
Trig identities & equations	**13/13**	**5/5**	**7/7**	stable — full marks
Iterative methods	**N/A**	**N/A**	**8/8**	**+ NEW — full marks**
Implicit / parametric differentiation	**11/11**	**6/6**	**8/8**	stable — full marks
Complex numbers (algebra + locus)	**4/4**	**9/9**	**7/7**	stable — full marks

QUESTION CATEGORY	SET 2	SET 3	SET 1	DELTA
Modulus equations / inequalities	**N/A**	**4/4**	**5/5**	**+ stable, full**
Partial fractions + expansion	**N/A**	**8/8**	**8/8**	**stable — full marks**
Logarithmic equations	**N/A**	**N/A**	**5/6**	**− domain rejection missed**
Vectors (lines only)	**2/2**	**7/8**	**8/9**	**+ stable on lines**
Vectors (with planes)	**0/11**	**N/A**	**N/A**	**− CARRY-OVER GAP**

NEXT STEPS

7-DAY · 30-DAY · EXAM-DAY

STEP 1

Domain Validation Drill for Log/Sqrt Equations THIS WEEK

For the next 10 $\log_b(\ldots)$ or √(...) equations you solve, after finding candidate roots, explicitly substitute each into the original argument and write "reject because [argument] < 0" for any invalid roots. Build the muscle so this becomes automatic on the live exam.

STEP 2

Three-Equation Vector Consistency Check 7 DAYS

When solving 3D-vector intersection problems, after finding λ and μ from the first two equations, NEVER write "LHS = RHS" without computing both sides numerically. If they disagree, the lines are skew — flag it explicitly. This recovers the Q9(b) mark and earns credit on broken QPs.

STEP 3

Vectors-with-Planes Carry-Over from Set 2 14 DAYS

Sets 4 and 5 (the two unmarked papers in the series) may include planes. Drill the four sub-skills again: equation of plane, line meets plane, line/plane angle, point-to-plane distance. Don't let the Set 2 misconception resurface.

STEP 4

Sit Mock Sets 4 and 5 21 DAYS

Complete the remaining two variants under timed conditions and self-mark using the EXAM-Paper-Check workflow. Compare against the trend tracker in this report — the goal is consistency at 96+%.

STEP 5

Continue the Convergent-Iteration Habit ONGOING

Q7(d) was a top-decile move — recognising the prescribed iteration diverges and switching to a convergent equivalent. Keep this instinct for any iteration question; if oscillation appears in 2–3 iterations, refactor.

STEP 6

Continue the Mark-Scheme Verification Instinct `ONGOING`

Eight verifiable MS errors caught across three papers. This is exceptional and should be the candidate's signature. On every numerical final answer, do a 10-second substitution check — it has earned full credit on every reconciliation to date.

STEP 7

Exam-Day Routine `FINAL EXAM`

First 90 seconds: read every question, mark which sub-parts are easiest, start there. Allocate ~1.4 minutes per mark. Never leave a sub-part blank without writing at least one equation — a single equation often earns M1.

✓ CERTIFICATION

REPORT AUTHENTICATION

NEURATECH ACADEMY · EXAMINATION MARKING CERTIFICATE

CANDIDATE
TAQBIR HOSSAIN KHAN

CANDIDATE ID
8588 · Centre BD 115

EXAMINATION
Cambridge Intl A Level Mathematics 9709/31

COMPONENT
Paper 3 · Pure Maths 3 · Mock Set 1/5

FINAL MARK
73 / 75 · 97.3% · Grade A*

MARKING DATE
28 April 2026

EXAMINER
Senior CAIE Examiner

VERIFICATION
Cross-examiner Q/A and MS Cross-check

RECONCILED DISCREPANCIES
3 (Q1, Q5(b), Q8(a)) — all in candidate's favour

CUMULATIVE MS ERRORS CAUGHT
8 across 3 papers — top-decile habit

TEMPLATE
EXAM-Paper-Check v1.0 · approved 2026-04-28

TRAJECTORY
81.3% → 96.0% → 97.3%

NEURATECH ACADEMY · OFFICIAL MARKING CERTIFICATE