RELEASED-PAPER REVIEW | 21 OCTOBER 2026

Paper 1 is out. What next?

2026 Mathematics 4052/01: 28 questions, 90 marks. Use the remaining concept gaps to focus Paper 2 practice.

Start with: extended graphs, quadratic modelling, matrices, non-right-angle trigonometry and the final real-world problem. Then cover vector proofs, cumulative frequency and composite-solid surface area.

Marks heatmap: what P1 covered, what recent P2s tested

Topic	2026 P1	2023 P2	2024 P2	2025 P2
Algebra & formulae	10	4	4	5
Equations & inequalities	9	8	12	10
Numbers & indices	11	1	4	3
Ratio, proportion & scales	6	3	2	6
Financial arithmetic	3	0	0	0
Percentages (also embedded)*	0	4	2	1
Functions & graphs	3	11	11	7
Rates, speed & travel graphs	4	2	2	0
Matrices	0	0	5	3
Sequences & patterns	0	10	0	0
Sets	3	0	0	4
Coordinate geometry	5	7	9	6
Vectors	1	4	0	0
Pythagoras, trig & bearings	6	0	9	11
Mensuration	8	13	7	6
Circle properties	4	4	0	0
Congruence & similarity	5	0	3	2
Angles / polygons (primary)*	0	0	0	6
Construction	0	0	0	0
Statistics	8	4	5	5
Probability	4	5	4	6
Final real-world problem	0	10	11	9

Read correctly: darker cells mean more marks, not higher predicted probability. Each mark has one primary topic. *Percentages appear in Q17/Q27; basic angle reasoning supports Q3/Q24 despite zero standalone-category marks. The final real-world problem is kept whole in the historical data.

P1 is not a topic-elimination list. Topics can recur across both papers. A zero is a revision gap, not a promise that P2 will contain it.

PAPER 1 AUDIT

All 28 questions accounted for

Printed marks, transcribed from the supplied scan. The primary-topic allocations below sum to 90.

Q / page	Concepts tested	Marks	Allocation
1 (p3)	Simplify a linear expression; factorise by grouping	3	ALG 3
2 (p4)	Prime factorisation; symbolic HCF; recover primes; LCM	5	NUM 5
3 (p5)	Circle angles with reasons: equal radii and centre/circumference	4	CIR 4
4 (p5)	Show an algebraic fraction has a constant value	2	ALG 2
5 (p6)	Find two added integers using median and range	2	STA 2
6 (p6)	Equal-distance journey: total time, average speed, unit conversion	4	SPD 4
7 (p6)	Find the obtuse angle from its sine	1	TRI 1
8 (p7)	Venn counts, compound set notation and a restricted-population probability	4	SET 3; PRO 1
9 (p8)	Write and calculate in standard form with an unknown exponent	3	NUM 3
10 (p8)	Grouped mean and effect of adding a value to a class	2	STA 2
11 (p9)	Combine two ratios and use a known difference	3	RAT 3
12 (p9)	Compare two box plots using median and spread in context	3	STA 3
13 (p10)	Solve a compound inequality and list all integer solutions	3	EQ 3
14 (p10)	Vector translation; line equation; distance between coordinates	6	VEC 1; COO 5
15 (p11)	Solve two simultaneous linear equations algebraically	3	EQ 3
16 (p11)	Add algebraic fractions with a squared linear denominator	2	ALG 2
17 (p11)	Remove a percentage conversion fee and find the exchange rate	3	FIN 3
18 (p12)	Annulus area from a chord tangent to the inner circle	2	MEN 2
19 (p13)	Complement probability; exactly two red counters in three draws	3	PRO 3
20 (p14)	Reverse bearing and two right-triangle distances	5	TRI 5
21 (p15)	Factorise and cancel a rational expression using square identities	3	ALG 3
22 (p15)	Solve a fractional equation whose quadratic terms cancel	3	EQ 3
23 (p15)	Simplify an expression with a negative fractional outer index	3	NUM 3
24 (p16)	Prove triangles similar, then find the height of the middle post	5	SIM 5
25 (p17)	Find a major-sector radius, then the volume of its folded cone	6	MEN 6
26 (p18)	Transform data to achieve a new mean and standard deviation	1	STA 1
27 (p18)	Square-root proportion and percentage increase	3	RAT 3
28 (p19)	Recover quadratic coefficients from the minimum point	3	GRF 3

Strand totals: Number & Algebra 49; Geometry & Measurement 29; Statistics & Probability 12. Supporting methods are not counted again. For example, Q18 is 2 mensuration marks but also uses circle properties and Pythagoras.

COVERAGE CHECK | NUMBER AND ALGEBRA

What was tested - and what remains

Use the 2026 O-Level 4052 content. The K310 document in the reference folder applies to 2027; its notation appendix is not a list of extra examinable topics.

Syllabus area	Observed in P1	Not explicitly tested / remaining skills
N1 Numbers	Q2, Q9, Q23: prime powers, HCF/LCM, standard form, negative/fractional indices.	Standalone estimation/rounding explanations, number classification, square/cube multipliers. Ordinary numerical calculation remains embedded.
N2 Ratio / proportion	Q11 linked ratios; Q27 direct square-root proportion.	Map distance/area scales and inverse proportion.
N3 Percentage	Q17 reverse percentage; Q27 percentage increase.	Successive changes and other percentage comparisons. Do not call percentages absent because their marks sit under finance/proportion.
N4 Rate / speed	Q6 total-time model, average speed and km/h to m/s.	Distance-time/speed-time interpretation, gradients, areas and more extended journeys.
N5 Algebra / formulae	Q1, Q4, Q16, Q21 manipulation and factorisation; Q6(a)(i) forms a time expression.	Sequences/nth term; explicit change of subject; longer formula modelling. Quadratic factorisation WAS tested.
N6 Functions / graphs	Q28 minimum point to coefficients; Q14(b) uses a straight-line equation.	Plotting curves, tangent gradients, line-curve intersections, graphical solutions/inequalities and exponential functions.
N7 Equations / inequalities	Q13 compound inequality; Q15 simultaneous linear equations; Q22 fractional-to-linear; Q8(a) forms a linear equation.	Solving a genuine quadratic, quadratic formula, equations from extended area/time models, and graphical solving.
N8 Sets	Q8 Venn counts, union/intersection/complement notation.	Subset notation and Venn shading were not explicitly required. Sets overall were tested.
N9 Matrices	No explicit question.	All matrix skills: dimensions, scalar operations, addition/product and interpreting entries in context.

Two easy misclassifications

Q22 contains x^2, but clearing the fractions cancels the quadratic terms: $13x - 2 = 9x - 3$. It tests a linear solution, $x = -1/4$.

Q28 does test the quadratic vertex relationship: $y = (x - 3)^2 - 11 = x^2 - 6x - 2$. So quadratic ideas were present, even though quadratic solving was absent.

COVERAGE CHECK | GEOMETRY, STATISTICS AND PROBABILITY

Do not cross off entire topics

“Not explicitly tested” refers to a particular skill. It does not mean its whole chapter was absent, or that the skill is guaranteed in P2.

Syllabus area	Observed in P1	Not explicitly tested / remaining skills
G1 Angles / construction	Triangle/parallel-line angle reasoning supports Q3 and Q24.	Polygon angle sums, regular polygons, quadrilateral/symmetry classification and geometrical constructions.
G2 Congruence / similarity	Q24 similarity proof and corresponding lengths.	Congruence tests/proofs; area and volume scale factors; enlargement/scale drawings; compass bisectors.
G3 Circle properties	Q3 equal radii and centre/circumference angles; Q18 tangent-radius/chord geometry.	Same-segment/opposite-segment reasoning and equal tangents were not explicitly demanded. Circle properties are not an absent topic.
G4 Pythagoras / trig	Q7 obtuse sine; Q20 bearings/right-angle trig; Pythagoras supports Q14(c), Q18 and Q25(b).	Sine/cosine rules, triangle area using sine, elevation/depression and 3D trigonometry.
G5 Mensuration	Q18 annulus area; Q25 major arc, cone net and cone volume.	Composite-solid surface area/volume, cylinders/prisms/pyramids/spheres, fluid transfer, sector/segment area and explicit radian conversion.
G6 Coordinates	Q14(b),(c): gradient, equation of a line and distance.	Extended coordinate geometry with intersections, parallel lines, shape constraints and ratios.
G7 Vectors	Only Q14(a), 1 primary mark: add a column vector to a point.	Vectors in a/b form, position-vector routes, segment ratios, parallelism/collinearity proofs and vector geometry.
S1 Statistics	Q5 median/range; Q10 grouped mean; Q12 box-plot comparison; Q26 transformation of mean/SD.	Cumulative frequency/percentiles, histograms, stem-leaf/dot plots, numerical SD, sampling and misleading displays. SD itself WAS tested.
S2 Probability	Q8(c) restricted sample space; Q19 complement and three draws without replacement.	Other independent/dependent-event settings and diagrams; probability is already substantially represented, not a fresh gap.

What the paper rewards: selecting a representation and explaining it.
Q10(b): the new 39-minute result enters the $30 < t \leq 40$ class, represented by midpoint 35. Since $35 < 36.4$, the estimated mean decreases.
Q25: the sector radius becomes the cone’s slant height; its arc becomes the base circumference. This is a change-of-representation problem, not just formula substitution.

PAPER 2 PREPARATION | FIRST PASS

Five priorities to practise first

These are revision priorities, not numerical exam probabilities. Only the final real-world-question format is specified by the syllabus.

Priority and evidence	Practise the method	Where to practise
Extended graphs Only the quadratic vertex relationship appeared. Recent P2 graph allocations were 11, 11 and 7 marks.	Plot a curve; draw a tangent; calculate gradient with units; use a suitable straight line to solve a related equation; recognise exponential functions.	2023 P2 Q4; 2024 P2 Q4; 2025 P2 Q5(b),(c) Textbook: 3A Ch5, Graphs of Functions and Graphical Solution; 4B §6.5-6.6.
Quadratic modelling and solving Q22 becomes linear. Quadratic factorisation and vertex form do not cover solving a quadratic.	Form an equation from area or journey times; clear fractions; solve by factorisation/formula; reject invalid roots with a reason.	2024 P2 Q6(a)-(c); 2025 P2 Q8(a)(i),(ii); 2023 P2 Q2(d) Textbook: 3A Ch1, Quadratic and Fractional Equations; 2A §6.5 for change of subject.
Matrices in context Completely absent in P1; present in P2 in 2024 and 2025. This supports priority, not a guarantee.	Choose row/column order; check compatible dimensions; multiply quantities by prices/weights; interpret an entry.	2024 P2 Q2(a); 2025 P2 Q3(d) Textbook: 4A Ch4, especially §4.3-4.4 (printed pp152, 162).
Non-right-angle and 3D trigonometry P1 used obtuse sine and right-angle bearings, with no sine/cosine-rule calculation.	Use sine/cosine rules and 1/2 ab sin C; connect a plan to an elevation triangle; keep full intermediate precision.	2024 P2 Q5; 2025 P2 Q6(a) Textbook: 3B Ch6 Further Trigonometry; Ch7 Applications of Trigonometry.
Final real-world problem The final real-world question is specified in the 2026 syllabus. Its context cannot be predicted from P1.	Select data, convert units, model time/cost/quantity, compare choices, state assumptions and justify a final decision.	2023 P2 Q9; 2024 P2 Q9; 2025 P2 Q9 Textbook: 4B Problems in Real-World Contexts (printed p181 onwards).

If you have one focused session: attempt one extended graph question, one quadratic-modelling question, one matrix question, one linked-trig question and one final real-world problem. Mark them, identify the failed step, then redo that step without notes.

Textbooks refer to think! Mathematics, 8th edition, in the supplied reference folder. Page numbers are printed book pages, not PDF viewer pages. Past-year references are taken from the previously audited 2023-25 practice guide.

PAPER 2 PREPARATION | SECOND PASS

Fill the gaps, then maintain breadth

A lightly tested skill deserves attention, but a familiar topic can return with a different method or a more demanding context.

Priority and evidence	Practise the method	Where to practise
Vector geometry and proof P1 allocated only 1 direct vector mark. Advanced vector methods remain untested; recent P2 allocation is variable.	Build vectors by routes, apply section ratios, show scalar multiples for collinearity/parallelism; link areas when appropriate.	2023 P2 Q6(a); 2023 P1 Q27 and 2024 P1 Q27(a),(b) as cross-paper drills Textbook: 4B Ch5, especially §5.5-5.7 (printed pp34-41).
Cumulative frequency and grouped data P1 had 8 statistics marks, but no cumulative-frequency graph or numerical SD calculation.	Read percentiles, convert percentages to counts, estimate grouped mean/SD, explain midpoint estimates and data limitations.	2025 P2 Q2(a)(i); 2024 P2 Q7(a),(b)(i) Textbook: 4A §3.1-3.2 and §3.4 (printed pp76-89, 115); 2B Ch13.
Composite solids and scale factors P1 tested a cone net and volume, but not composite exposed surfaces or similar-solid scaling.	Count only exposed surfaces; conserve volume; connect radii/heights; use squared and cubed scale factors; revise radians/segments.	2023 P2 Q3; 2025 P2 Q6(b); 2024 P2 Q8(a)(ii),(b) Textbook: 2B Ch11; 3B Ch8 and Ch10.
Sequences, construction and other gaps Absence alone is weak evidence. P2 sequences occurred in 2023, but not 2024-25; construction had 0 primary marks in these three P2s.	Do a short nth-term/proof drill, compass construction, polygon angles, map scales and interest calculation. Do not replace the core practice above.	2023 P2 Q8; 2025 P1 Q7; 2024 P1 Q6; 2024 P1 Q16 (last three are cross-paper drills) Textbook: Sec1 C7 and C11; 4B §6.1-6.2; 3B Ch9 for congruence.

Keep these already-tested skills ready

Algebraic fractions; coordinate geometry; percentage multipliers; probability without replacement; circle reasoning; bearings; similarity. P1 coverage does not remove them from P2. The historical heatmap shows algebra, mensuration and statistics appearing in both papers in each of 2023-25.

Use a short mixed refresher for these rather than treating every P1 topic as a top gap. In particular, “exactly two of a colour in three draws” has already appeared in Q19(b), so it is not a newly untested probability prediction.

A practical two-pass plan

Pass 1: use the five priorities on page 5.
Pass 2: do vector proof, cumulative frequency/SD and a composite-solid problem; then spend a short final block on sequences, construction, polygons, map scales and interest.
Finish: practise writing the final contextual sentence, keeping units and delaying rounding.

FORECAST AUDIT | ORIGINAL CHATGPT SPECIMEN

Useful practice, imperfect prediction

Comparison against the original preserved Paper 1 specimen. “Close method” means a similar solving process, not identical questions, numbers or diagrams.

Our P1 Q	Result / actual Q	What matched or differed
1	Partial Q2	Prime factorisation matched; HCF/LCM and recovering primes replaced the predicted perfect-cube task.
2	Partial Q9(a)	Standard-form writing matched. The measured-area upper-bound task did not appear.
3	Partial Q27	Square-root proportional reasoning matched broadly; actual was direct proportion and a percentage increase, not inverse proportion.
4	Partial Q17, Q27	Percentage multipliers were useful. Actual used a conversion fee and a proportion change, not successive price changes.
5	Partial Q1(a), Q21	Expansion skills were useful. There was no explicit make-a-variable-the-subject task.
6	Close method Q13	Compound inequality, negative coefficient and integer endpoints: a close method match.
7	Partial Q8	Union, intersection and complement notation matched; actual also required Venn counts and a restricted population.
8	Not seen None	No matrices question in actual P1.
9	Close method Q12	Compare box plots using the median and IQR in context: a close method match.
10	Partial Q3, Q18	Circle properties were relevant, but actual used centre/circumference angles and chord geometry instead of the same angle chain.
11	Partial Q24	Similarity appeared as a triangle proof and linked lengths. Similar-solid area/volume scaling did not appear.
12	Partial Q14(b)	Gradient and line equation were relevant; no perpendicular-bisector equation was required.
13	Close method Q21	Factorise a rational expression and cancel common factors. Actual added a difference of squares in the numerator.

The strongest matches: compound inequalities and integer endpoints (our Q6 → actual Q13); box-plot comparisons (Q9 → Q12); factorising and simplifying rational expressions (Q13 → Q21); vertex form and the minimum point (Q14 → Q28).

The earlier revision guide also highlighted grouping, fractional indices and symbolic HCF/LCM, which appeared in actual Q1(b), Q23 and Q2. The specimen itself did not adequately sample all of those methods. Broad guide coverage is not a specimen-question hit.

FORECAST AUDIT | CONTINUED

The misses matter too

A correct broad topic call is weaker than predicting the actual question structure. This review preserves that distinction.

Our P1 Q	Result / actual Q	What matched or differed
14	Close method Q28	The vertex-form/minimum-point relationship matched; actual asked for coefficients in the reverse direction.
15	Not seen None	No compound-interest question in actual P1; currency exchange is a different financial method.
16	Not seen None	No speed-time graph. Actual Q6 was an average-speed word problem, so only the broader topic overlapped.
17	Not seen None	No sequence or nth-term question in actual P1.
18	Not seen None	No regular-polygon angle question in actual P1.
19	Partial Q20	Reverse bearing matched. Actual distances used right-angle trig, not the cosine rule.
20	Partial Q25(a)	Sector/arc relationships were relevant; actual worked in degrees and then folded the sector into a cone.
21	Partial Q14(a),(c)	Coordinate-vector and distance skills overlapped; no section-ratio point was required.
22	Partial Q19(b)	Without-replacement and exactly-one-type methods were useful; actual selected three counters and required exactly two red.
23	Partial Q10(a), Q26	Mean and transformation ideas were relevant; actual required grouped reasoning and both scaling and translation.
24	Not seen None	No ruler-and-compass construction question in actual P1.
25	Partial Q22	Clearing fractions matched, but the actual equation reduced to linear. The predicted quadratic-solving step was absent.
26	Not seen None	No curve-line intersections or graphical inequality in actual P1.

Clear misses: seven original specimen questions, totalling 25 of its 90 marks, used methods not seen in actual P1: matrices, compound interest, speed-time graphs, sequences, regular polygons, construction and curve-line graph work. This is not a 65/90 prediction score: the remaining 65 specimen marks include partial matches and untested subparts.

Important actual structures we did not reproduce: Q10 grouped-mean reasoning, Q18 the tangent-chord annulus, Q24 crossed-post similarity, and Q25 folding a sector into a cone. Actual P1 also had 28 questions, compared with our 26.

Claude cross-check: its P1 Q10 matched simultaneous-equation solving (actual Q15); Q19 matched right-angle bearings (actual Q20); Q21(c) matched finding a sector radius from arc length (actual Q25(a)); Q26 matched vertex form (actual Q28). Its matrix, construction and cumulative-frequency questions did not appear in this P1. This is a brief comparison, not a full Claude accuracy score.

Sources and scope: supplied 2026 4052/01 scan (all 20 PDF pages); local 4052 syllabus; SEAB's official 2026 syllabus; preserved ChatGPT and Claude P1 specimens; earlier audited 2023-25 topic ledger/practice references; supplied think! textbooks. This is an independent topic audit, not an official marking scheme or advance knowledge of P2.