

# Cambridge IGCSE Mathematics 0580 Mock Paper — Papers 2 and 4 with Full Worked Solutions

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**Quick answer:** Cambridge IGCSE Mathematics (0580) has no coursework — you enter one tier and sit two papers. **Core:** Paper 1, no calculator (1 h 30, 80 marks) and Paper 3, scientific calculator required (1 h 30, 80 marks), each worth **50%**, with grades C to G available. **Extended:** Paper 2, no calculator (**2 hours**, 100 marks) and Paper 4, scientific calculator required (**2 hours**, 100 marks), each worth **50%**, with grades A\* to E available. From the 2025 examination series, **Papers 1 and 2 are non-calculator papers**, and a list of formulas is printed on page 2 of the question paper.



The change that matters most from 2025: Papers 1 and 2 are non-calculator, so method beats answer.

Assessment at a glance: Cambridge IGCSE Mathematics 0580 (2025, 2026 and 2027)

| Tier     | Paper   | Time    | Marks | Weighting | Calculator                     | Grades  |
|----------|---------|---------|-------|-----------|--------------------------------|---------|
| Core     | Paper 1 | 1 h 30  | 80    | 50%       | Not allowed                    | C to G  |
|          | Paper 3 | 1 h 30  | 80    | 50%       | Scientific calculator required |         |
| Extended | Paper 2 | 2 hours | 100   | 50%       | Not allowed                    | A* to E |
|          | Paper 4 | 2 hours | 100   | 50%       | Scientific calculator required |         |

Candidates sit **both papers of one tier** (Core: Papers 1 and 3; Extended: Papers 2 and 4). Everything is externally assessed by Cambridge — there is **no coursework**. The Extended content includes the whole Core content plus additional material.

**Four points about the 2025–2027 papers:** (1) **Paper 1 (Core) is now a non-calculator paper** with a duration of 1 h 30; (2) **Paper 2 (Extended) is now a non-calculator paper** with a duration of 2 hours; (3) Paper 3 is now 1 h 30 and Paper 4 is now 2 hours, and both still allow a calculator; (4) a **list of formulas is printed on page 2** of all four papers — you no longer recall every formula, but you must still know which one to use.

Content areas and equipment

| Area                          | Content                                                                                                                                            |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 Number                      | Four operations, fractions and decimals, percentages, ratio and proportion, standard form, indices, surds, bounds, scale                           |
| 2 Algebra and graphs          | Simplifying and factorising, equations and inequalities, simultaneous equations, functions and graphs, sequences, direct and inverse variation     |
| 3 Coordinate geometry         | Equations of lines, gradients, parallel and perpendicular lines, distance and midpoint                                                             |
| 4 Geometry                    | Angles and parallel lines, triangles and polygons, circle properties (angles at the centre and circumference, tangents), similarity and congruence |
| 5 Mensuration                 | Perimeter, area, surface area and volume (including cylinders, cones, spheres), ratios in similar shapes                                           |
| 6 Trigonometry                | Pythagoras, sine, cosine and tangent, sine and cosine rules, 3D trigonometry, exact values for 30°, 45° and 60°                                    |
| 7 Vectors and transformations | Vector arithmetic, translation, reflection, rotation, enlargement                                                                                  |
| 8 Probability                 | Probability calculations, tree diagrams, mutually exclusive and independent events, conditional probability (Extended)                             |

| Area         | Content                                                                                                            |
|--------------|--------------------------------------------------------------------------------------------------------------------|
| 9 Statistics | Mean, median and mode, quartiles and box-and-whisker plots, cumulative frequency, scatter diagrams and correlation |

**Equipment:** a **scientific calculator** is required for Papers 3 and 4 (one with trigonometric functions is strongly recommended; algebraic or graphical calculators are not permitted) and is **not** allowed in Papers 1 and 2. Bring a **protractor and ruler** (compasses recommended) to every paper. For  $\pi$ , use your calculator value or 3.142.

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## How this paper was written, and its copyright status

This mock paper was written by TutorZone tutors from the publicly available *Cambridge IGCSE Mathematics 0580* syllabus for examinations in 2025, 2026 and 2027 (version 3, published May 2024) — its assessment structure and content areas. It is **not a Cambridge past paper, specimen paper or official paper**. Cambridge, IGCSE and the associated syllabus documents are the copyright of Cambridge Assessment International Education, and no official question or syllabus content is reproduced. Every question, worked solution and marking note is original, and each numerical answer has been independently checked. The mark allocations are this paper's own, laid out to mirror the official 100-mark papers.

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## Paper 2 mock paper (Extended, no calculator, 100 marks)

**Section A (8 questions, 5 marks each, 40 marks)** — show your working; give answers to 3 significant figures or exactly, unless told otherwise.

1. Simplify  $\sqrt{50} - \sqrt{18} + \sqrt{8}$ , giving your answer as a simplified surd. (5 marks)
2. (a) Write 0.00000425 in standard form. (2 marks)  
(b) Work out  $(3 \times 10^5) \times (4 \times 10^{-3})$ , giving your answer in standard form. (3 marks)
3. Factorise  $6x^2 + 11x - 35$ . (5 marks)
4. Solve  $3/(x + 1) = 2/(x - 2)$ . (5 marks)
5. Find the size of each interior angle of a regular 12-sided polygon. (5 marks)
6. Given  $\tan 60^\circ = \sqrt{3}$  and  $\sin 30^\circ = \frac{1}{2}$ , show that  $\tan 60^\circ \times \sin 30^\circ = \sqrt{3}/2$ . (5 marks)
7. Given  $A : B = 3 : 5$  and  $B : C = 2 : 7$ , find  $A : B : C$ . (5 marks)
8. Given the vectors  $\mathbf{a} = (3, -2)$  and  $\mathbf{b} = (-1, 4)$ , find the exact value of  $|2\mathbf{a} - \mathbf{b}|$ . (5 marks)

**Section B (3 questions, 20 marks each, 60 marks)**

9. The curve  $y = x^2 - 4x - 5$  crosses the x-axis at A and B.

- (a) Find the coordinates of A and B. (6 marks)
- (b) Find the coordinates of the turning point. (6 marks)
- (c) Hence solve  $x^2 - 4x - 5 = 7$ . (8 marks)

10. In a circle, AB is a diameter and C is a point on the circumference with  $\angle ABC = 35^\circ$ .

- (a) Find  $\angle ACB$ , giving a reason. (10 marks)
- (b) Find  $\angle BAC$ . (5 marks)
- (c) Given that the radius is 6 cm, find the length of AC (3 significant figures). (5 marks)

11. A bag contains 5 red, 3 blue and 4 green balls (12 in total).

- (a) One ball is taken at random. Find  $P(\text{red})$ . (3 marks)
- (b) Find  $P(\text{not green})$ . (3 marks)
- (c) Two balls are taken without replacement. Find  $P(\text{red then blue})$ . (6 marks)
- (d) Two balls are taken without replacement. Find  $P(\text{at least one red})$ . (8 marks)

## Paper 2 answers and marking notes

1. **5 marks:**  $\sqrt{50} = 5\sqrt{2}$ ,  $\sqrt{18} = 3\sqrt{2}$ ,  $\sqrt{8} = 2\sqrt{2}$  (1 each);  $5\sqrt{2} - 3\sqrt{2} + 2\sqrt{2} = 4\sqrt{2}$  (2).

2. **(a) 2 marks:**  $4.25 \times 10^{-6}$ . **(b) 3 marks:**  $3 \times 4 = 12$  (1);  $10^5 \times 10^{-3} = 10^2$  (1); answer  $1.2 \times 10^3$  (1).

3. **5 marks:**  $(2x + 7)(3x - 5)$  (2 + 2, with 1 for a correct expansion check). Any correct equivalent factorisation is accepted.

4. **5 marks:** cross-multiply:  $3(x - 2) = 2(x + 1)$  (2);  $3x - 6 = 2x + 2$  (1);  $x = 8$  (2). State  $x \neq -1, 2$ .

5. **5 marks:** exterior angle  $= 360 \div 12 = 30^\circ$  (2); interior angle  $= 180 - 30 = 150^\circ$  (3).

6. **5 marks:**  $\tan 60^\circ = \sqrt{3}$  and  $\sin 30^\circ = \frac{1}{2}$  (1 each);  $\sqrt{3} \times \frac{1}{2} = \sqrt{3}/2$  (3, with the proof clearly set out).

7. **5 marks:** make B common using the LCM 10 (2);  $A : B = 6 : 10$  and  $B : C = 10 : 35$  (2);  **$A : B : C = 6 : 10 : 35$**  (1).

8. **5 marks:**  $2a = (6, -4)$  (1);  $2a - b = (7, -8)$  (2);  $|2a - b| = \sqrt{7^2 + 8^2} = \sqrt{113}$  (2).

9. **20 marks:** (a)  $(x - 5)(x + 1) = 0 \Rightarrow A(5, 0), B(-1, 0)$  (6). (b) axis of symmetry  $x = 2 \Rightarrow y = -9 \Rightarrow (2, -9)$  (6). (c)  $x^2 - 4x - 12 = 0 \Rightarrow (x - 6)(x + 2) = 0 \Rightarrow x = 6 \text{ or } x = -2$  (8). (c) may also be read off from the curve and the line  $y = 12$ .

10. **20 marks:** (a)  $\angle ACB = 90^\circ$  (10) — reason: **the angle in a semicircle is  $90^\circ$** ; an answer with no reason scores at most half. (b)  $\angle BAC = 180 - 90 - 35 = 55^\circ$  (5). (c)  $AC = 12 \cos 35^\circ \approx 9.83 \text{ cm}$  (5).

11. **20 marks:** (a)  $5/12$  (3). (b)  $8/12 = 2/3$  (3). (c)  $5/12 \times 3/11 = 15/132 = 5/44$  (6; keeping 12 as the second denominator loses marks). (d)  $1 - (7/12)(6/11) = 1 - 42/132 = 15/22$  (8); adding the three cases directly is also accepted.

## Paper 4 mock paper (Extended, calculator required, 100 marks)

**Section A (8 questions, 5 marks each, 40 marks)** — show the formula or method used; give answers to 3 significant figures unless told otherwise.

1. An item priced at \$240 is increased by 15% and then reduced by 15%. Find the final price. (5 marks)
2. \$5,000 is invested at 3.5% per year compound interest for 6 years. Find the total value, to the nearest cent. (5 marks)
3. An object has mass 3.2 kg and volume  $0.004 \text{ m}^3$ . Find its density in  $\text{kg/m}^3$ . (5 marks)
4. In a right-angled triangle the opposite side is 7 cm and the hypotenuse is 12 cm. Find the acute angle (1 decimal place) and the length of the adjacent side. (5 marks)
5. For the data 12, 15, 11, 19, 15, 18, find the mean, the median and the mode. (5 marks)
6. A and B are independent events with  $P(A) = 0.6$  and  $P(B) = 0.3$ . Find  $P(A \text{ and } B)$  and  $P(A \text{ or } B)$ . (5 marks)
7. A length is measured as 12.5 cm correct to 1 decimal place. Find the upper and lower bounds. (5 marks)
8. The exchange rate is  $\text{£}1 = 10.5 \text{ HKD}$ . Convert 5,000 HKD to pounds, to the nearest penny. (5 marks)

**Section B (3 questions, 20 marks each, 60 marks)**

9. Given  $y = 2x^3 - 9x^2 + 12x + 5$ :
  - (a) find  $\frac{dy}{dx}$ ; (4 marks)
  - (b) find the coordinates of the stationary points; (8 marks)
  - (c) determine the nature of each stationary point; (4 marks)
  - (d) find the equation of the tangent to the curve at  $x = 1$ . (4 marks)
10. A cuboid measures 8 cm by 6 cm by 5 cm.
  - (a) Find the length of the diagonal of the base. (5 marks)
  - (b) Find the length of the space diagonal, from one vertex to the opposite vertex (3 significant figures). (8 marks)
  - (c) Find the angle between the space diagonal and the base (1 decimal place). (7 marks)
11. A city has a population of 25,000 growing at 2.4% per year.
  - (a) Find the population after 10 years, to the nearest hundred. (8 marks)
  - (b) Find the least number of years for the population to exceed 30,000. (8 marks)
  - (c) If the population instead grew linearly by 600 people a year, what would it be after 10 years, and how does that compare with the exponential model? (4 marks)

## Paper 4 answers and marking notes

- 1. 5 marks:**  $240 \times 1.15 = 276$  (2);  $276 \times 0.85 = \mathbf{\$234.60}$  (3). "\$240, the changes cancel out" is a conceptual error.
- 2. 5 marks:**  $5000(1.035)^6$  (3) = **\$6,146.28** (2). Simple interest  $5000(1 + 0.035 \times 6) = \$6,050$  scores nothing.
- 3. 5 marks:** density = mass  $\div$  volume (2);  $3.2 \div 0.004 = \mathbf{800 \text{ kg/m}^3}$  (3).
- 4. 5 marks:**  $\sin \theta = 7/12 \Rightarrow \theta \approx \mathbf{35.7^\circ}$  (3); adjacent =  $\sqrt{(12^2 - 7^2)} = \sqrt{95} \approx \mathbf{9.75 \text{ cm}}$  (2).
- 5. 5 marks:** mean =  $90 \div 6 = \mathbf{15}$  (2); median = **15** (2); mode = **15** (1).
- 6. 5 marks:**  $P(A \text{ and } B) = 0.6 \times 0.3 = \mathbf{0.18}$  (3);  $P(A \text{ or } B) = 0.6 + 0.3 - 0.18 = \mathbf{0.72}$  (2).
- 7. 5 marks:** upper bound **12.55 cm** (3); lower bound **12.45 cm** (2).
- 8. 5 marks:**  $5000 \div 10.5$  (3) = **£476.19** (2).
- 9. 20 marks:** (a)  $dy/dx = \mathbf{6x^2 - 18x + 12}$  (4). (b)  $6(x^2 - 3x + 2) = 0 \Rightarrow x = 1 \text{ or } 2$  (4);  $y(1) = 10, y(2) = 9 \Rightarrow \mathbf{(1, 10)}$  and  $\mathbf{(2, 9)}$  (4). (c)  $y'' = 12x - 18$ : at  $x = 1, y'' = -6 < 0 \Rightarrow \mathbf{\text{maximum}}$ ; at  $x = 2, y'' = 6 > 0 \Rightarrow \mathbf{\text{minimum}}$  (4). (d) gradient at  $x = 1$  is 0  $\Rightarrow$  tangent is the horizontal line  **$y = 10$**  (4).
- 10. 20 marks:** (a)  $\sqrt{8^2 + 6^2} = \mathbf{10 \text{ cm}}$  (5). (b)  $\sqrt{10^2 + 5^2} = \sqrt{125} \approx \mathbf{11.2 \text{ cm}}$  (8; using  $8^2 + 6^2 + 5^2$  in one step is accepted). (c)  $\tan \theta = 5/10 \Rightarrow \theta \approx \mathbf{26.6^\circ}$  (7). The angle must be taken in the right triangle formed by the space diagonal and the base; using the wrong side (e.g.  $\tan \theta = 5/8$ ) scores nothing.
- 11. 20 marks:** (a)  $25000(1.024)^{10}$  (4) = 31,691  $\Rightarrow$  about **31,700** (4). (b)  $1.024^n > 1.2 \Rightarrow n > \ln 1.2 / \ln 1.024 \approx 7.66 \Rightarrow \mathbf{8 \text{ years}}$  (8; answering 7.66 without rounding up loses 2). (c) linear:  $25,000 + 600 \times 10 = \mathbf{31,000}$  (2); the exponential model is about 700 higher (2).

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## If you are sitting the Core tier (Papers 1 and 3)

- **Same shape, lighter content:** each Core paper is 80 marks in 1 h 30 and tests core content only — 3D trigonometry, vectors, calculus and the deeper probability and statistics work are Extended material.
- **Grade C is the ceiling:** check university and subject requirements before choosing the tier; many pathways need an Extended grade.
- **Paper 1 is also non-calculator:** practise fractions, decimals, surds, percentages and estimation by hand.
- **Method marks apply equally:** the same three-step discipline (formula, substitution, answer) protects you at both tiers.

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## Where marks are most often lost

- **Answers without working:** IGCSE maths carries many method (M) marks — a bare answer can still lose most of them.
- **Ignoring the required accuracy:** follow the 3 significant figures or decimal places asked for; rounding early throws off the final answer.
- **Units and conversions:** area and volume conversions ( $\text{cm}^2 \leftrightarrow \text{m}^2$ ,  $\text{cm}^3 \leftrightarrow \text{m}^3$ ), currency, rates and density.

- **Calculator set-up:** check Papers 3 and 4 are in **degree** mode, and note that algebraic or graphical calculators are not permitted.
- **Forgetting "without replacement":** the second denominator must be one less (12 balls become 11).
- **Circle theorems without reasons:** when a question says "give a reason", the name of the theorem must appear.
- **Constructions and graphs:** keep your construction arcs, and label axes and key points.

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## A twelve-week preparation plan (Extended)

| Weeks | Content                                                                             | Focus                                                           |
|-------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| 1–2   | Number, percentages, ratio, standard form, surds                                    | Non-calculator mental work and estimation (ten questions a day) |
| 3–4   | Algebra: expanding, factorising, equations and inequalities, simultaneous equations | Solving quadratics by factorising without a calculator          |
| 5–6   | Functions and graphs, coordinate geometry, sequences                                | Sketching and finding turning points                            |
| 7–8   | Geometry, circle properties, mensuration, similarity                                | Theorem names and constructions                                 |
| 9     | Trigonometry (including 3D) and vectors                                             | Degree mode; sine and cosine rules                              |
| 10    | Probability and statistics                                                          | Tree diagrams, box plots, cumulative frequency                  |
| 11    | Calculus (Extended)                                                                 | Differentiating, stationary points, tangents                    |
| 12    | Timed papers: Paper 2 (2 h) then Paper 4 (2 h)                                      | About 1.2 minutes per mark                                      |

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## FAQ

### Core or Extended?

Extended covers the core content plus additional material and is the route to grades up to A\*, which most progression pathways expect. Core caps the grade at C; it can reduce pressure for a student focused on a pass, but check the requirements of the intended sixth-form or university course first.

### May I use a graphical calculator?

No. Papers 3 and 4 require a scientific calculator (trigonometric functions strongly recommended); algebraic and graphical calculators are not permitted, and Papers 1 and 2 allow no calculator at all.

### Which formulas are given?

The list of formulas is printed on page 2 of the question paper and includes area, volume and (at Extended) the sine rule. It does not cover everything, so you still need to know when each formula applies.

### Can I sit just one paper?

No — you sit both papers of the same tier.

### Is there any coursework in 0580?

None. The qualification is entirely examined (Core: Papers 1 and 3; Extended: Papers 2 and 4).

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### Official sources to check against

| Source                                                                        | What to use it for                                                                           |
|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| <a href="#">Cambridge IGCSE Mathematics 0580 syllabus for 2025–2027 (PDF)</a> | Confirming the papers, timings, marks, weightings, calculator rules and the list of formulas |
| <a href="#">Cambridge IGCSE Mathematics 0580 subject page</a>                 | The latest syllabus version, resources and exam administration                               |
| <a href="#">Cambridge Assessment International Education</a>                  | Timetables, entries and results information                                                  |

Also useful: the [IB Mathematics AA SL mock paper](#) and the [TutorZone exam practice questions](#). For IGCSE maths tuition, start with the [subject guides](#) and then get matched with a tutor.