

CAMBRIDGE IGCSE (0580) — EXAM PRACTICE WORKBOOK

Cambridge IGCSE (0580) Extended Booster — Practice Workbook

(Extended Tier • 2025–2027 Syllabus)

42 Exam-Style IGCSE Practice Questions, Working Spaces & Complete Answer
Key

- 1-Page Syllabus Cross-Reference Guide (which UK GCSE topics to skip)
- 42 Exam-Style IGCSE Questions (6 progressive questions per topic)
- Structured Working Spaces & Mark Allocations on every question
- Complete Answer Key Appendix at the back

Student Name: _____

School / Class: _____

Target Grade: _____



SCAN FOR INTERACTIVE IGCSE PRACTICE & WORKED SOLUTIONS

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CROSS-REF CHECKLIST — SYLLABUS BRIDGE

Cambridge IGCSE (0580 / 0980 · 2025–2027) Cross-Reference Guide

Use this Extended Booster Booklet alongside our main Grades 1–9 Booklets for complete coverage of the updated 2025–2027 Cambridge IGCSE (0580 & 0980) syllabus.

2025–2027 Syllabus Additions Already in Main Booklets: Make sure you revise **Trigonometry Exact Values** (Grade 5 Booklet — tested on Non-Calculator Paper 2!) and **Surds: Simplifying, Expanding & Rationalising** (Grade 7 Booklet). Note that Matrices, Linear Programming, Box-and-Whisker Plots, Loci, and Proper Subsets ($\subset$) have been removed for 2025–2027.

1. UK-GCSE-ONLY TOPICS TO SKIP IN THE MAIN GRADES 3–9 BOOKLETS

Topic in Main Booklet	Booklet	IGCSE Guidance
3D Plans & Elevations	Grade 3	Keep nets & surface area/volume; skip plan/elevation drawings
Frequency Trees	Grade 3	UK GCSE only — not examined on Cambridge 0580
Constructions & Loci	Grade 4	Loci & ruler-compass bisectors removed in 2025–2027 (triangle construction only)
Product Rule for Counting	Grade 6	UK GCSE only — not examined on Cambridge 0580
Box Plots	Grade 6	Box-and-whisker plots removed from 0580 in 2025–2027 (keep Cumulative Freq!)
Stratified Sampling & Capture-Recapture	Grade 6	UK GCSE only — not examined on Cambridge 0580
Iteration	Grade 8	Fixed-point iteration is not on Cambridge 0580
Equation of a Circle	Grade 9	$x^2 + y^2 = r^2$ is not on Cambridge 0580

2. YOUR 7 EXTRA IGCSE TOPICS MASTERED IN THIS BOOKLET

IGCSE Extension Topic	Syllabus Area	Notes	Practice
1. Formal Set-Builder & Subset Notation	Probability	☐	☐
2. 3D Symmetry: Planes & Rotational Axes	Geometry and Measures	☐	☐
3. Cubic & Exponential Sequences	Algebra	☐	☐
4. Functions: Domain & Range	Algebra	☐	☐
5. Curve Asymptotes & Exponential Equations	Algebra	☐	☐
6. Magnitude (Modulus) of a Vector	Geometry and Measures	☐	☐
7. Differentiation & Turning Points	Algebra	☐	☐

3. BONUS 0580 (2025–2027) EXAM-FORMAT & TOPIC BRIDGE

- New 50/50 Non-Calculator Exam Split:** Paper 2 (Extended, 2 hrs, 100 marks, 50%) is now **strictly Non-Calculator**, and Paper 4 (2 hrs, 100 marks, 50%) is Calculator (both provide a 2-page Formula Sheet). Recall squares up to 15^2 and cubes of 1, 2, 3, 4, 5, 10 without a calculator.
- Solving Trig Equations for $0^\circ \leq x \leq 360^\circ$:** Find **both** angles in $0^\circ \leq x \leq 360^\circ$ (e.g. $\sin x = 0.5$ or $2 \cos x + 1 = 0$). From primary angle θ , use symmetry: $\sin x \rightarrow 180^\circ - \theta$ | $\cos x \rightarrow 360^\circ - \theta$ | $\tan x \rightarrow \theta + 180^\circ$.
- Fractional Power Graphs ($n = \frac{1}{2}$ and $n = -\frac{1}{2}$):** New for 2025–2027 alongside Topic 5: recognise $y = ax^{1/2} = a\sqrt{x}$ (starts at (0, 0), curves gently for $x \geq 0$) and $y = ax^{-1/2} = \frac{a}{\sqrt{x}}$ (first quadrant for $a > 0$, asymptotes $x = 0$ and $y = 0$).
- Stem-and-Leaf Diagrams & Congruence Criteria:** Revise **Stem-and-Leaf (incl. Back-to-Back)** diagrams for median/IQR (Grade 3 Booklet — still tested on 0580), and **skip** formal Congruent Triangle Proofs (SSS, SAS, ASA, RHS — removed in 2025–2027).

Formal Set-Builder & Subset Notation

CAMBRIDGE IGCSE (0580) EXAM PRACTICE**Total: 11 marks**

Formal Set-Builder & Subset Notation — Practice Questions

Answer all 6 questions. Show clear algebraic working in the spaces provided.

Question 1**(1 mark)**

Given the set $B = \{\text{positive factors of } 36\}$, write down the value of $n(B)$.

WORKING OUT SPACE

Answer:**Question 2****(1 mark)**

Let $M = \{x : x \text{ is a factor of } 24\}$. How many integers k satisfy BOTH $k \in M$ and $k > 7$?

WORKING OUT SPACE

Answer:**Question 3****(2 marks)**

Sets P and Q satisfy $P \subseteq Q$, with $n(\mathcal{E}) = 30$, $n(P) = 8$ and $n(Q) = 21$.

Work out $n(P' \cap Q)$.

WORKING OUT SPACE

Answer:

Question 4**(2 marks)**

$A = \{1, 4, 9, 16\}$, $B = \{2, 4, 8, 16\}$ and $C = \{4, 6, 8, 10\}$ (within universal set $\mathcal{E} = \{1, 2, \dots, 20\}$).
List the elements of $A \cap B \cap C$.

WORKING OUT SPACE

Answer:

Question 5**(2 marks)**

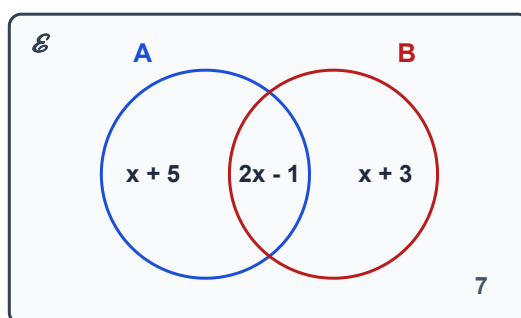
$\mathcal{E} = \{\text{integers}\}$, $A = \{x : 3x + 2 > -4\}$ and $B = \{x : 2x + 1 \leq 9\}$.
List all the elements of $A \cap B$.

WORKING OUT SPACE

Answer:

Question 6**(3 marks)**

The Venn diagram shows the number of elements in each region of $\mathcal{E}$.



Given that $n(\mathcal{E}) = 30$, find $n(A \cup B)$.

WORKING OUT SPACE

Answer:

3D Symmetry: Planes & Rotational Axes

CAMBRIDGE IGCSE (0580) EXAM PRACTICE**Total: 8 marks**

3D Symmetry: Planes & Rotational Axes — Practice Questions

Answer all 6 questions. Show clear algebraic working in the spaces provided.

Question 1**(1 mark)**

A cuboid has a **square cross-section** of $4\text{ cm} \times 4\text{ cm}$ and length 10 cm .

Write down the total number of planes of symmetry of this cuboid.

WORKING OUT SPACE

Answer:

Question 2**(1 mark)**

A uniform prism has a **regular pentagon** as its cross-section and length 20 cm .

Write down the total number of planes of symmetry of the prism.

WORKING OUT SPACE

Answer:

Question 3**(1 mark)**

A prism has cross-section a **parallelogram** (with sides 4 cm and 7 cm and interior angles 60° and 120°) and length 12 cm .

How many planes of symmetry does this prism have?

WORKING OUT SPACE

Answer:

Question 4**(1 mark)**

How many **axes of rotational symmetry** in total does a $3\text{ cm} \times 5\text{ cm} \times 9\text{ cm}$ cuboid have?

WORKING OUT SPACE

Answer:**Question 5****(2 marks)**

For a cube, write down:

- (a) the number of axes of rotational symmetry of order 4,
- (b) the total number of axes of rotational symmetry.

WORKING OUT SPACE

Answer: (a) **(b)****Question 6****(2 marks)**

A right pyramid has a regular hexagon as its base and an apex directly above the centre of the base.
Write down:

- (a) the total number of planes of symmetry of the pyramid,
- (b) the order of rotational symmetry about the vertical axis through the apex.

WORKING OUT SPACE

Answer: (a) **(b)**

Cubic & Exponential Sequences

CAMBRIDGE IGCSE (0580) EXAM PRACTICE

Total: 13 marks

Cubic & Exponential Sequences — Practice Questions

Answer all 6 questions. Show clear algebraic working in the spaces provided.

Question 1**(2 marks)**

Here are the first five terms of a cubic sequence:

$-2, 5, 24, 61, 122$

Find an expression, in terms of n , for the n th term of this sequence.

WORKING OUT SPACE

Answer:

Question 2**(3 marks)**

Here are the first five terms of a sequence:

$3, 7, 21, 51, 103$

Find the n th term of this sequence in terms of n .

WORKING OUT SPACE

Answer:

Question 3**(2 marks)**

Here are the first terms of an exponential (geometric) sequence:

5, 10, 20, 40, 80, ...

Work out the 10th term of this sequence.

WORKING OUT SPACE

Answer:

Question 4**(2 marks)**

Find an expression, in terms of n , for the n th term of the sequence:

1, 2, 5, 12, 27

WORKING OUT SPACE

Answer:

Question 5**(2 marks)**

In a tile pattern, Diagram n has $W = 3n + 1$ white tiles and $G = n^2$ grey tiles.

Find a simplified expression, in terms of n , for the **total number of tiles** T in Diagram n .

WORKING OUT SPACE

Answer:

Question 6**(2 marks)**

In the dot-and-line pattern where $D = (n + 1)^2$ and $L = 2n^2 + 2n$, work out $L - D$ when $n = 10$.

WORKING OUT SPACE

Answer:

Functions: Domain & Range

CAMBRIDGE IGCSE (0580) EXAM PRACTICE**Total: 13 marks**

Functions: Domain & Range — Practice Questions

Answer all 6 questions. Show clear algebraic working in the spaces provided.

Question 1**(2 marks)**

The function f is defined by $f(x) = \frac{4x + 1}{2x + 6}$.

State the value of x that must be **excluded** from any domain of f .

WORKING OUT SPACE

Answer:**Question 2****(2 marks)**

The real-valued function h is defined by $h(x) = \sqrt{15 - 3x}$.

Write down an inequality in x for the largest possible domain of h .

WORKING OUT SPACE

Answer:**Question 3****(2 marks)**

Find the range of the function $f(x) = 5x + 1$ for the domain $x > -1$.

Write your answer as an inequality in $f(x)$ or y (e.g. $f(x) \geq 2$).

WORKING OUT SPACE

Answer:

Question 4**(2 marks)**

The function f is defined by $f(x) = (x - 1)^2 + 2$ for the domain $-3 \leq x \leq 3$.

The range of f is $a \leq f(x) \leq b$. Work out the values of a and b .

WORKING OUT SPACE

Answer:

Question 5**(3 marks)**

The one-to-one function f is defined by $f(x) = x^2 + 4x - 3$ for $x \geq -2$.

Complete the square to find the range of f , and hence state the **domain of the inverse function** $f^{-1}(x)$.

WORKING OUT SPACE

Answer:

Question 6**(2 marks)**

The function f is defined by $f(x) = (x - 4)^2 - 1$ for the domain $x \geq 4$.

Work out the value of $f^{-1}(35)$.

WORKING OUT SPACE

Answer:

Curve Asymptotes & Exponential Equations

CAMBRIDGE IGCSE (0580) EXAM PRACTICE

Curve Asymptotes & Exponential Equations — Practice Questions

Total: 11 marks

Answer all 6 questions. Show clear algebraic working in the spaces provided.

Question 1**(1 mark)**

Write down the equation of the **horizontal asymptote** of the curve $y = \frac{7}{x} - 5$.

WORKING OUT SPACE

Answer:**Question 2****(1 mark)**

Write down the equation of the **vertical asymptote** of the curve $y = \frac{4}{(x+5)^2} + 7$.

WORKING OUT SPACE

Answer:**Question 3****(1 mark)**

Write down the equation of the asymptote of the exponential curve $y = 3^x - 6$.

WORKING OUT SPACE

Answer:

Question 4**(2 marks)**

Find the coordinates of the point where the curve $y = 2^{x+3} - 1$ crosses the y -axis.

WORKING OUT SPACE

Answer:

Question 5**(3 marks)**

Solve the exponential equation:

$$3^{2x+1} = 81$$

WORKING OUT SPACE

Answer:

Question 6**(3 marks)**

Solve the exponential equation:

$$\frac{9^x}{3^{x-4}} = \frac{1}{27}$$

WORKING OUT SPACE

Answer:

Magnitude (Modulus) of a Vector

CAMBRIDGE IGCSE (0580) EXAM PRACTICE

Total: 13 marks

Magnitude (Modulus) of a Vector — Practice Questions

Answer all 6 questions. Show clear algebraic working in the spaces provided.

Question 1**(2 marks)**

Given that $\mathbf{a} = \begin{pmatrix} -5 \\ 12 \end{pmatrix}$, work out $|\mathbf{a}|$.

WORKING OUT SPACE

Answer:

Question 2**(2 marks)**

A vector is given in component form as $\mathbf{p} = -10\mathbf{i} + 24\mathbf{j}$.
Calculate the magnitude $|\mathbf{p}|$.

WORKING OUT SPACE

Answer:

Question 3**(2 marks)**

Given that $\mathbf{a} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} 1 \\ -3 \end{pmatrix}$, work out $|3\mathbf{a} - \mathbf{b}|$.

WORKING OUT SPACE

Answer:

Question 4**(2 marks)**

Given that $\overrightarrow{AB} = \begin{pmatrix} 11 \\ -3 \end{pmatrix}$ and $\overrightarrow{BC} = \begin{pmatrix} -3 \\ -12 \end{pmatrix}$, work out $|\overrightarrow{AC}|$.

WORKING OUT SPACE

Answer:

Question 5**(2 marks)**

Given that $\mathbf{a} = \begin{pmatrix} k \\ -12 \end{pmatrix}$ where $k < 0$, and $|\mathbf{a}| = 13$, find the value of k .

WORKING OUT SPACE

Answer:

Question 6**(3 marks)**

Let $\mathbf{a} = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} 2 \\ 5 \end{pmatrix}$.

Given that $k > 0$ and $|\mathbf{a} + k\mathbf{b}| = 13$, find the value of k .

WORKING OUT SPACE

Answer:

Differentiation & Turning Points

CAMBRIDGE IGCSE (0580) EXAM PRACTICE

Total: 17 marks

Differentiation & Turning Points — Practice Questions

Answer all 6 questions. Show clear algebraic working in the spaces provided.

Question 1**(2 marks)**

Given that $y = 2x^3 + 6x^2 - 3x + 11$, find $\frac{dy}{dx}$.

WORKING OUT SPACE

Answer:

Question 2**(2 marks)**

Expand and simplify first to find $\frac{dy}{dx}$ when $y = (2x + 3)(x - 4)$.

WORKING OUT SPACE

Answer:

Question 3**(2 marks)**

Find the gradient of the curve $y = x^3 + 4x^2 - 5x + 7$ at the point where $x = -2$.

WORKING OUT SPACE

Answer:

Question 4**(3 marks)**

Find the equation of the tangent to the curve $y = x^3 - 2x^2 + x$ at the point $(2, 2)$.

Give your answer in the form $y = mx + c$.

WORKING OUT SPACE

Answer:**Question 5****(4 marks)**

A curve has equation $y = x^3 - 3x^2 - 9x + 7$.

Use differentiation to find the coordinates of its two stationary points, and state which is the local maximum.

WORKING OUT SPACE

Answer:**Question 6****(4 marks)**

A rectangular paddock against a long hedge is divided into two equal pens by an internal fence parallel to the ends of length x m (so three sides have length x m). Given that 120 m of fencing is used in total, form an expression in terms of x for the total area A , and use differentiation to find the maximum total area of the paddock (in m^2).

WORKING OUT SPACE

Answer:

APPENDIX

Answers & Mark Schemes

Final answers and mark allocations for all 42 CAMBRIDGE IGCSE (0580 / 0980) practice questions. Scan the cover QR code for interactive step-by-step worked solutions online.

Topic 1: Formal Set-Builder & Subset Notation

Q1:	9	[1m]
Q2:	3	[1m]
Q3:	13	[2m]
Q4:	{4}	[2m]
Q5:	{-1, 0, 1, 2, 3, 4}	[2m]
Q6:	23	[3m]

Topic 2: 3D Symmetry: Planes & Rotational Axes

Q1:	5	[1m]
Q2:	6	[1m]
Q3:	1	[1m]
Q4:	3	[1m]
Q5:	(a) 3, (b) 13	[2m]
Q6:	(a) 6, (b) 6	[2m]

Topic 3: Cubic & Exponential Sequences

Q1:	$n^3 - 3$	[2m]
Q2:	$n^3 - n^2 + 3$	[3m]
Q3:	2560	[2m]
Q4:	$2^n - n$	[2m]
Q5:	$n^2 + 3n + 1$	[2m]
Q6:	99	[2m]

Topic 4: Functions: Domain & Range

Q1:	-3	[2m]
Q2:	$x \leq 5$	[2m]
Q3:	$f(x) > -4$	[2m]
Q4:	$a = 2, b = 18$	[2m]
Q5:	$x \geq -7$	[3m]
Q6:	10	[2m]

Topic 5: Curve Asymptotes & Exponential Equations

Q1:	$y = -5$	[1m]
Q2:	$x = -5$	[1m]
Q3:	$y = -6$	[1m]
Q4:	(0, 7)	[2m]
Q5:	1.5	[3m]
Q6:	-7	[3m]

Topic 6: Magnitude (Modulus) of a Vector

Q1:	13	[2m]
Q2:	26	[2m]
Q3:	13	[2m]
Q4:	17	[2m]
Q5:	-5	[2m]
Q6:	2	[3m]

Topic 7: Differentiation & Turning Points

Q1:	$6x^2 + 12x - 3$	[2m]
Q2:	$4x - 5$	[2m]
Q3:	-9	[2m]
Q4:	$y = 5x - 8$	[3m]
Q5:	Max (-1, 12), Min (3, -20)	[4m]
Q6:	$A = 120x - 3x^2; 1200$	[4m]