

IGCSE 數學 0580 Paper 2 練習卷 (Extended • 不準用計算機) | 19 題 100 分

年級：中四至中五 (IGCSE Extended) | 科目：數學 (0580 Paper 2) | 時限：120 分鐘 | 總分：100 分 | 不準使用計算機

Section A — 短題目 (第 1 – 10 題)

Section A 是短題目，考核基本運算與公式運用，每題 4 – 5 分，目標是在 50 分鐘內完成並保持準確。

1. Answer all three parts without a calculator.

- (a) Write 0.000 046 in standard form. (1 分)
- (b) Work out $\frac{3}{4} + \frac{5}{6}$, giving your answer as a fraction in its simplest form. (2 分)
- (c) Work out $(2.4 \times 10^6) \times (5 \times 10^{-3})$, giving your answer in standard form. (1 分)

2. A laptop has a normal price of \$640. In a sale the price is reduced by 15%.

- (a) Work out the reduction, in dollars. (1 分)
- (b) Work out the sale price of the laptop. (1 分)
- (c) After the sale the shop raises the sale price by 10%. Work out the new price and the percentage change from the normal price. (2 分)

3. A map is drawn to a scale of 1 : 25 000.

- (a) On the map a road is 6.4 cm long. Work out the real length, in km. (2 分)
- (b) A field is 1.8 km long. Work out its length on the map, in cm. (2 分)
- (c) Work out the real area, in m^2 , represented by 1 cm^2 on the map. (1 分)

4. Do not use a calculator.

- (a) Work out $27^{(2/3)}$. (2 分)
- (b) Simplify $\sqrt{50} + \sqrt{18}$, giving your answer in the form $k\sqrt{2}$. (2 分)

5. The first four terms of a sequence are 5, 11, 17, 23, ...

- (a) Find the n th term of the sequence. (2 分)
- (b) Find the 40th term. (1 分)
- (c) Explain whether 200 is a term of this sequence. (1 分)

6. Show your working for each part.

- (a) Expand and simplify $(2x - 3)(x + 5)$. (2 分)
- (b) Factorise completely $6x^2 - 15x$. (1 分)
- (c) Factorise $x^2 - 9$. (1 分)

7. Show all your working.

- (a) Solve the simultaneous equations $3x + 2y = 16$ and $x - y = 2$. (3 分)
- (b) Make x the subject of $5y - 3x = 10$. (2 分)

- 8.
- (a) Work out the interior angle of a regular pentagon. (2 分)
 - (b) Write down the exterior angle of a regular pentagon. (1 分)
 - (c) The interior angle of a regular polygon is 156° . Work out the number of sides. (2 分)
9. All lengths are in cm. Give exact answers where possible.
- (a) A right-angled triangle has hypotenuse 13 cm and one side 5 cm. Work out the third side. (2 分)
 - (b) In a right-angled triangle the hypotenuse is 14 cm and one angle is 30° . Work out the side opposite the 30° angle. (1 分)
 - (c) Work out the side adjacent to the 30° angle in part (b), in the form $k\sqrt{3}$. (2 分)
10. A bag contains 5 red, 3 blue and 2 green counters. All the counters are different. Two counters are taken at random without replacement.
- (a) Write down the probability that the first counter is red. (1 分)
 - (b) Work out the probability that both counters are red. (2 分)
 - (c) Work out the probability that at least one counter is green. (2 分)

Section B — 長題目 (第 11 – 19 題)

Section B 是長題目，需要寫出完整方法，包括二次方程、立體圖形、統計表、三角面積、函數、向量與證明。

11. Show your method for both parts.
- (a) Solve $2x^2 - 7x + 3 = 0$, showing your factorisation. (3 分)
 - (b) Write $x^2 - 6x + 5$ in the form $(x - a)^2 + b$, and state the coordinates of the minimum point of $y = x^2 - 6x + 5$. (3 分)
12. The line L passes through A(2, 5) and B(6, 13).
- (a) Work out the gradient of L. (2 分)
 - (b) Find the equation of L in the form $y = mx + c$. (2 分)
 - (c) Find the x-intercept of L. (1 分)
 - (d) Explain whether the point (10, 21) lies on L. (1 分)
13. A closed cylinder has radius 7 cm and height 10 cm. Use $\pi = 22/7$.
- (a) Work out the volume of the cylinder, in cm^3 . (3 分)
 - (b) Work out the curved surface area, in cm^2 . (2 分)
 - (c) Work out the total surface area of the closed cylinder, in cm^2 . (2 分)
14. In a sale a bicycle is sold for \$272 after a 20% discount.
- (a) Work out the normal price of the bicycle. (3 分)
 - (b) A shop assistant adds 20% to \$272 and says this is the normal price. Explain, with figures, why this is wrong. (3 分)

15. The table shows the number of goals scored by a football team in each of its matches this season.

- (a) Work out the mean number of goals per match. (3 分)
- (b) Work out the median number of goals. (2 分)
- (c) Write down the mode. (1 分)
- (d) How many matches had 3 or more goals? (1 分)

Goals per match (x)	0	1	2	3	4
Number of matches (f)	4	9	12	3	2

Goals per match (x) and number of matches (f)

16. Triangle ABC has $AB = AC = 8$ cm and angle $BAC = 60^\circ$.

- (a) Show that $BC = 8$ cm. (2 分)
- (b) Work out the area of triangle ABC, in the form $k\sqrt{3}$ cm². (2 分)
- (c) The triangle is the cross-section of a prism of length 12 cm. Work out the volume of the prism, correct to 3 significant figures. (3 分)

17. $f(x) = 3x - 2$ and $g(x) = x^2 + 1$.

- (a) Find $f^{-1}(x)$. (2 分)
- (b) Work out $gf(2)$. (2 分)
- (c) Explain whether $f(x) = g(x)$ has any real solutions. (2 分)

18. In triangle OAB, $OA = a$ and $OB = b$. P is the midpoint of OA. Q lies on AB with $AQ : QB = 1 : 3$.

- (a) Find PQ in terms of a and b, in its simplest form. (3 分)
- (b) M is the midpoint of AB. Show that PQ is parallel to OM and state the ratio PQ : OM. (3 分)

19. Answer both parts.

- (a) Solve the inequality $4 - 3x < 13$. (2 分)
- (b) n is an integer. Prove that $n^2 + n$ is always an even number. (2 分)

時間分配建議 (全卷 120 分鐘)

閱讀全卷、分配時間 5 分鐘

Section A (第 1 – 10 題) 50 分鐘

Section B (第 11 – 19 題) 55 分鐘

覆核：單位、有效數字、代回驗算 10 分鐘

注意事項

- 本卷為 2 小時、100 分、不準使用計算機，與劍橋 IGCSE 數學 0580 Extended Paper 2 的考制一致；題目全部原創，並非劍橋歷屆試題。

- 全卷 19 題，總分 100 分；每題旁的分數就是該部分可得的分數，分數越高的部分通常需要越多步驟。
- 不准用計算機，所以答案應盡量寫成整數、分數或根式；若題目要求有效數字，請寫明取位（例如 333 cm^3 ）。
- 長題目（第 11 – 19 題）要寫出方法步驟，只有答案不給方法分。
- 圓柱題用 $\pi = 22/7$ ；三角比的精確值（ $\sin 30^\circ = 1/2$ 、 $\cos 30^\circ = \sqrt{3}/2$ ）要背。
- 建議先做 Section A，把較難的 Section B 留到有足夠時間時處理。

TutorZone IGCSE Mathematics 0580 Paper 2 (Extended, non-calculator) practice paper | 題目全部原創，並非劍橋國際歷屆試題；
評分要點與等級描述為本卷自訂。