

2025-DSE
MATH CP
PAPER 1

HONG KONG EXAMINATIONS AND ASSESSMENT AUTHORITY
HONG KONG DIPLOMA OF SECONDARY EDUCATION EXAMINATION 2025

MATHEMATICS Compulsory Part

PAPER 1

Question-Answer Book

8:30 am – 10:45 am (2¼ hours)

This paper must be answered in English

INSTRUCTIONS

- (1) After the announcement of the start of the examination, you should first write your Candidate Number in the space provided on Page 1 and stick barcode labels in the spaces provided on Pages 1, 3, 5, 7, 9 and 11.
- (2) This paper consists of THREE sections, A(1), A(2) and B.
- (3) Attempt ALL questions in this paper. Write your answers in the spaces provided in this Question-Answer Book. Do not write in the margins. Answers written in the margins will not be marked.
- (4) Graph paper and supplementary answer sheets will be supplied on request. Write your Candidate Number, mark the question number box and stick a barcode label on each sheet, and fasten them with string INSIDE this book.
- (5) Unless otherwise specified, all working must be clearly shown.
- (6) Unless otherwise specified, numerical answers should be either exact or correct to 3 significant figures.
- (7) The diagrams in this paper are not necessarily drawn to scale.
- (8) No extra time will be given to candidates for sticking on the barcode labels or filling in the question number boxes after the 'Time is up' announcement.

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Candidate Number



SECTION A(1) (35 marks)

1. Simplify $\frac{(x^4 y^{-5})^3}{xy^2}$ and express your answer with positive indices. (3 marks)

2. Simplify $\frac{1}{3d-4} - \frac{2}{6d+5}$. (3 marks)

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3. Let m and n be two numbers. The sum of $2m$ and $3n$ is 999 while the ratio of m to n is $8:7$. Find n . (3 marks)

4. The coordinates of the point A are $(4, -2)$. A is rotated clockwise about the origin O through 90° to B .

- (a) Write down the coordinates of B .
- (b) Suppose that B is translated upwards by t units to the point C . If A , O and C are collinear, find t . (3 marks)

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5. Factorize

(a) $10pr - 6qr$,

(b) $25p^2 - 9q^2$,

(c) $25p^2 - 9q^2 - 10pr + 6qr$.

(4 marks)

6. Consider the compound inequality

$$\frac{6x+1}{2} < x-8 \text{ or } 3x \leq -21 \dots\dots\dots (*) .$$

(a) Solve (*) .

(b) Write down the greatest integer satisfying (*) .

(4 marks)

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7. The selling price of a souvenir is \$ 378 . The souvenir is sold at a discount of 60% on its marked price. The marked price of the souvenir is 75% above its cost.

- (a) Find the marked price of the souvenir.
- (b) Find the cost of the souvenir.
- (c) Determine whether there is a gain or a loss after selling the souvenir. Explain your answer. (5 marks)

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- (5 marks)

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9. The table below shows the distribution of the numbers of pens owned by some students.

Number of pens	5	6	7	8	9
Number of students	9	13	2	s	11

The median of the distribution is 7.

- (a) Find the least possible value of s .
- (b) Write down the greatest possible value of s .
- (c) Find the greatest possible standard deviation of the distribution.

(5 marks)

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SECTION A(2) (35 marks)

10. Let $f(x) = 2x^3 + hx^2 + kx + 15$, where h and k are constants. When $f(x)$ is divided by $x + 2$, the remainder is -45 . It is given that $f(x)$ is divisible by $2x - 5$.

(a) Find h and k .

(3 marks)

(b) Someone claims that all the roots of the equation $f(x) = 0$ are rational numbers. Do you agree? Explain your answer. (3 marks)

(3 marks)

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- (b) Let c be a real constant. Find the range of values of c such that the equation $p(x) = c$ has two distinct real roots. (3 marks)

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15. There are 8 white plates, 4 red plates and 1 black plate in a box. If 3 plates are randomly drawn from the box at the same time, find

- (a) the probability that the colours of the 3 plates drawn are the same; (2 marks)
- (b) the probability that the colours of the 3 plates drawn are all different. (2 marks)

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(2 marks)

(2 marks)

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- (b) Find the least value of n such that the sum of the first n terms of the arithmetic sequence is greater than 10^6 . (3 marks)

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- (8 marks)

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