



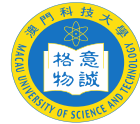
澳門大學
UNIVERSIDADE DE MACAU
UNIVERSITY OF MACAU



澳門理工大學
Universidade Politécnica de Macau
Macao Polytechnic University



澳門旅遊學院
INSTITUTO DE FORMAÇÃO TURÍSTICA DE MACAU
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澳門科技大學
UNIVERSIDADE DE CIÊNCIA E TECNOLOGIA DE MACAU
MACAU UNIVERSITY OF SCIENCE AND TECHNOLOGY

2023 年澳門四高校聯合入學考試（語言科及數學科）

**2023 Joint Admission Examination for Macao Four Higher
Education Institutions (Languages and Mathematics)**

考試大綱 Syllabus

數學附加卷 Mathematics Supplementary Paper

考試時間：一小時

數學科附加卷的考試大綱包括數學科考試大綱的內容，並加上：

1. 函數：函數的概念、定義域及值域。圖。反函數。
2. 立體幾何：簡易立體圖形，包括長方體、角柱、圓柱、角錐、直立圓錐、球體。
3. 線性方程組：不多於三個未知量。 $n \times n$ 矩陣；矩陣加法及乘法 ($n \leq 3$)。行列式（階數不大於三）。
4. 解析幾何：切線與法線。極座標。
5. 三角：三角函數方程及其通解。
6. 基本微積分：多項式的和、差、積、商的微分法。極大值、極小值及拐點。多項式的不定積分。不定積分和定積分的簡易性質。利用定積分計算面積。
7. 曲線的描繪：偶、奇及週期函數。導數的應用。
8. 向量：純量與二維空間中的向量；向量加法及純量乘法。位置向量。笛卡兒分量。純量積。
9. 複數：虛數。複數的運算。二次多項式的複根。複數的極式。有理指數的棣美弗定理。 n 次根。

附錄--數學符號

除了數學正卷所用到的符號外，數學附加卷亦會採用以下符號：

$f^{-1}(x)$	函數 $f(x)$ 的反函數。
\overrightarrow{AB}	從點 A 到點 B 的向量。
$ \overrightarrow{AB} $	\overrightarrow{AB} 的大小 (長度)。
$\overrightarrow{AB} \cdot \overrightarrow{CD}$	\overrightarrow{AB} 與 \overrightarrow{CD} 的純量積。
$ A $	方陣 A 的行列式。
$\frac{dy}{dx}, \frac{d^2y}{dx^2}$	y 的一階及二階導數。
$f'(x), f''(x)$	$f(x)$ 的一階及二階導數。
$\int f(x) dx$	$f(x)$ 的不定積分。
$\int_a^b f(x) dx$	$f(x)$ 在區間 $[a, b]$ 上的定積分。
$\operatorname{Re}(z), \operatorname{Im}(z), z ,$ $\arg(z), \bar{z}$	複數 z 的實部、虛部、模、幅角及共軛。

Examination Duration: 1 hour

The syllabus of the Mathematics Supplementary Paper includes the contents in the Mathematics Examination Syllabus, together with:

1. Functions: Concept of function, domain and range. Graphs. Inverse functions.
2. Solid Geometry: Simple solid figures, including rectangular block, prism, cylinder, pyramid, right circular cone and sphere.
3. System of Linear Equations: No more than three unknowns. $n \times n$ matrices: addition and multiplication of matrices ($n \leq 3$). Determinants (up to order 3).
4. Coordinate Geometry: Tangent and normal. Polar coordinates.
5. Trigonometry: Trigonometric equations and general solutions.
6. Basic Calculus: Differentiation of a sum, a difference, a product, and a quotient of polynomials. Maxima, minima and inflection points. Indefinite integral of polynomials. Simple properties of indefinite integrals and definite integrals. Area by integration.
7. Curve Sketching: Even, odd and periodic functions. Application of derivatives.
8. Vectors: Scalars and vectors in 2-dimensional space; vector addition and scalar multiplication. Position vectors. Cartesian components. Scalar product.
9. Complex Numbers: Imaginary numbers. Manipulation of complex numbers. Complex roots of quadratic equations. Polar form of complex numbers. De Moivre's theorem for rational indices. n -th root.

Appendix – Mathematical Symbols

In addition to those notations used in the Mathematics Standard Paper, the Mathematics Supplementary Paper adopts the following notations:

$f^{-1}(x)$	Inverse function of the function $f(x)$.
\overrightarrow{AB}	Vector from point A to point B .
$ \overrightarrow{AB} $	Magnitude (length) of \overrightarrow{AB} .
$\overrightarrow{AB} \cdot \overrightarrow{CD}$	Scalar product of \overrightarrow{AB} and \overrightarrow{CD} .
$ A $	Determinant of the square matrix A .
$\frac{dy}{dx}, \frac{d^2y}{dx^2}$	First and second derivatives of y .
$f'(x), f''(x)$	First and second derivatives of $f(x)$.
$\int f(x) dx$	Indefinite integral of $f(x)$.
$\int_a^b f(x) dx$	Definite integral of $f(x)$ over interval $[a, b]$.
$\operatorname{Re}(z), \operatorname{Im}(z), z , \arg(z), \bar{z}$	The real part, imaginary part, modulus, argument, and conjugate of the complex number z .