Edexcel IGCSE 4MA1

Geometry & Trigonometry Vocabulary

几何与三角词汇卡

Topic 4 | Foundation & Higher

FREE | Edexcel 4MA1 | Bilingual 双语

Bilingual Vocabulary Cards 双语词汇卡

For Chinese-English Math Education

适用于中英双语数学教学

Vocab Tables Printable Flashcards Foundation & Higher

How to Use This Resource / 使用说明 **What's inside / 内容概览**

- **Vocabulary Tables** (p. 3–7) — 75+ bilingual terms with pinyin & definitions
- **Flashcards** (p. 8–13) — 3 sets of printable cards, print front/back pages back-to-back
- **Higher labels** — Look for *(H)* to spot Higher-only content

Differentiation Tips / 分层教学建议

- **Foundation students** — Focus on terms without the *(H)* marker
- **Higher students** — Learn all terms including *(H)* items
- **Bilingual learners** — Use the Chinese and Pinyin columns for support
- **Printing tip** — Print flashcard pages double-sided for front/back cards

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Also available for Edexcel 4MA1: **Numbers & Number System**, **Equations, Formulae & Identities**, **Sequences, Functions & Graphs**, **Vectors & Transformation Geometry**, **Statistics & Probability** Vocabulary Cards

4.1 Angles, Lines and Triangles & 4.2 Polygons

4.1 角、 线 与 三 角 形　4.2 多 边 形

Basic Shapes & Triangles | 基本形状与三角形

English 英文	Chinese 中文	Pinyin 拼音	Definition 定义
Point	点	diǎn	A position in space with no size
Line segment	线段	xiàn duàn	A straight path between two points
Parallel	平行	píng xíng	Lines that never meet, always the same distance apart
Perpendicular	垂直	chuí zhí	Lines meeting at a right angle ($90°$)
Triangle	三角形	sān jiǎo xíng	A shape with 3 sides; angles sum to $180°$
Equilateral triangle	等边三角形	děng biān sān jiǎo xíng	All sides and angles equal ($60°$ each)
Isosceles triangle	等腰三角形	děng yāo sān jiǎo xíng	Two equal sides and two equal base angles
Right-angled triangle	直角三角形	zhí jiǎo sān jiǎo xíng	A triangle with one $90°$ angle

Quadrilaterals & Polygons | 四边形与多边形

English 英文	Chinese 中文	Pinyin 拼音	Definition 定义
Quadrilateral	四边形	sì biān xíng	A shape with 4 sides; angles sum to $360°$
Parallelogram	平行四边形	píng xíng sì biān xíng	Opposite sides parallel and equal
Trapezium	梯形	tī xíng	Exactly one pair of parallel sides
Rhombus	菱形	líng xíng	All sides equal; opposite angles equal
Kite	鸢形	yuān xíng	Two pairs of adjacent equal sides
Polygon	多边形	duō biān xíng	A closed shape with 3 or more straight sides
Regular polygon	正多边形	zhèng duō biān xíng	All sides and all angles are equal
Interior angle	内角	nèi jiǎo	An angle inside a polygon
Exterior angle	外角	wài jiǎo	An angle between a side and its extension

4.1 Angles & Lines, 4.6 Circle Properties

4.1 角 与 线　4.6 圆 的 性 质

Circle Parts | 圆的组成

English 英文	Chinese 中文	Pinyin 拼音	Definition 定义
Circle	圆	yuán	A set of points equidistant from a centre
Radius	半径	bàn jìng	Distance from centre to circumference
Diameter	直径	zhí jìng	A chord through the centre; $d = 2r$
Circumference	圆周	yuán zhōu	The perimeter of a circle; $C = \pi d$
Chord	弦	xián	A line segment joining two points on a circle
Arc	弧	hú	A part of the circumference
Sector	扇形	shàn xíng	The region between two radii and an arc
Tangent	切线	qiē xiàn	A line touching the circle at exactly one point

Angle Properties | 角的性质

English 英文	Chinese 中文	Pinyin 拼音	Definition 定义
Corresponding angles	同位角	tóng wèi jiǎo	Equal angles on same side of transversal (F-shape)
Alternate angles	内错角	nèi cuò jiǎo	Equal angles on opposite sides of transversal (Z-shape)
Co-interior angles	同旁内角	tóng páng nèi jiǎo	Angles on same side of transversal; sum $= 180°$
Vertically opposite angles	对顶角	duì dǐng jiǎo	Angles opposite each other when two lines intersect; equal
Bearing	方位角	fāng wèi jiǎo	Direction measured clockwise from North $(000°–360°)$
Cyclic quadrilateral	圆内接四边形	yuán nèi jiē sì biān xíng	All 4 vertices on a circle; opposite angles sum to $180°$ *(H)*
Alternate segment	弧切角	hú qiē jiǎo	Angle between tangent and chord $=$ angle in alternate segment *(H)*

4.3 Symmetry, 4.9–4.10 Mensuration & 4.11 Similarity

4.3 对 称　4.9–4.10 量 度　4.11 相 似

Similarity & Symmetry | 相似与对称

English 英文	Chinese 中文	Pinyin 拼音	Definition 定义
Similar	相似	xiāng sì	Same shape, different size; proportional sides
Congruent	全等	quán děng	Same shape and same size
Scale factor	比例因数	bǐ lì yīn shù	The ratio of corresponding lengths in similar shapes
Line symmetry	线对称	xiàn duì chèn	A shape can be folded along a line to match exactly
Rotational symmetry	旋转对称	xuán zhuǎn duì chèn	A shape looks the same after rotation less than $360°$

Perimeter, Area & Volume | 周长、面积与体积

English 英文	Chinese 中文	Pinyin 拼音	Definition 定义
Perimeter	周长	zhōu cháng	The total distance around the outside of a shape
Area	面积	miàn jī	The amount of space inside a 2D shape
Pi (π)	圆周率	yuán zhōu lǜ	Ratio of circumference to diameter; ≈ 3.14159
Arc length	弧长	hú cháng	$l = \frac{\theta}{360} \times 2\pi r$; length of an arc *(H)*
Sector area	扇形面积	shàn xíng miàn jī	$A = \frac{\theta}{360} \times \pi r^2$; area of a sector *(H)*
Surface area	表面积	biǎo miàn jī	Total area of all faces of a 3D solid
Volume	体积	tǐ jī	The amount of 3D space a solid occupies
Prism	棱柱	léng zhù	A solid with uniform cross-section; $V =$ area $\times$ length
Cylinder	圆柱	yuán zhù	A prism with circular cross-section; $V = \pi r^2 h$
Pyramid	棱锥	léng zhuī	A solid with polygon base and apex; $V = \frac{1}{3} \times$ base $\times h$ *(H)*
Cone	圆锥	yuán zhuī	A solid with circular base and apex; $V = \frac{1}{3}\pi r^2 h$ *(H)*
Sphere	球体	qiú tǐ	A perfectly round solid; $V = \frac{4}{3}\pi r^3$ *(H)*

4.8 Trigonometry and Pythagoras' Theorem

4.8 三 角 学 与 勾 股 定 理

Pythagoras' Theorem | 勾股定理

English 英文	Chinese 中文	Pinyin 拼音	Definition 定义
Pythagoras' theorem	勾股定理	gōu gǔ dìng lǐ	$a^2 + b^2 = c^2$; relates sides of a right-angled triangle
Hypotenuse	斜边	xié biān	The longest side; opposite the right angle
Right angle	直角	zhí jiǎo	An angle of exactly $90°$
3D Pythagoras	三维勾股	sān wéi gōu gǔ	Using Pythagoras in 3D shapes *(H)*

Basic Trigonometry | 基础三角学

English 英文	Chinese 中文	Pinyin 拼音	Definition 定义
Opposite (side)	对边	duì biān	The side across from a given angle
Adjacent (side)	邻边	lín biān	The side next to a given angle (not the hypotenuse)
Sine (sin)	正弦	zhèng xián	$\sin\theta = \frac{\text{opposite}}{\text{hypotenuse}}$
Cosine (cos)	余弦	yú xián	$\cos\theta = \frac{\text{adjacent}}{\text{hypotenuse}}$
Tangent (tan)	正切	zhèng qiē	$\tan\theta = \frac{\text{opposite}}{\text{adjacent}}$
SOHCAHTOA	三角比口诀	sān jiǎo bǐ kǒu jué	Memory aid: Sin=O/H, Cos=A/H, Tan=O/A
Inverse trig function	反三角函数	fǎn sān jiǎo hán shù	$\sin^{-1}$, $\cos^{-1}$, $\tan^{-1}$; used to find an angle
Angle of elevation	仰角	yǎng jiǎo	Angle measured upwards from the horizontal
Angle of depression	俯角	fǔ jiǎo	Angle measured downwards from the horizontal

4.8 Trigonometry (Advanced — Sine & Cosine Rules, 3D)

4.8 三角学（高级 — 正弦与余弦定理、三维）

Sine & Cosine Rules | 正弦与余弦定理

English 英文	Chinese 中文	Pinyin 拼音	Definition 定义
Sine rule	正弦定理	zhèng xián dìng lǐ	$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ for any triangle *(H)*
Cosine rule	余弦定理	yú xián dìng lǐ	$a^2 = b^2 + c^2 - 2bc\cos A$ *(H)*
Area formula (trig)	三角面积公式	sān jiǎo miàn jī gōng shì	Area $= \frac{1}{2}ab\sin C$ *(H)*
Included angle	夹角	jiā jiǎo	The angle between two known sides *(H)*
Ambiguous case	二解情况	èr jiě qíng kuàng	Sine rule may give two possible triangles *(H)*

Exact Values & 3D Trigonometry | 精确值与三维三角学

English 英文	Chinese 中文	Pinyin 拼音	Definition 定义
Exact value	精确值	jīng què zhí	Values like $\sin 30° = \frac{1}{2}$, without rounding *(H)*
3D trigonometry	三维三角学	sān wéi sān jiǎo xué	Using trig in three dimensions *(H)*
Angle between line and plane	线面角	xiàn miàn jiǎo	Angle from a line to the plane it meets *(H)*
Obtuse angle	钝角	dùn jiǎo	An angle between $90°$ and $180°$ *(H)*
Acute angle	锐角	ruì jiǎo	An angle between $0°$ and $90°$

Flashcards — Front (Terms)

闪 卡 正 面 — 术 语

Triangle

三 角 形

Parallel

平 行

Radius

半 径

Polygon

多 边 形

Similar

相 似

Congruent

全 等

Cut along dashed lines. Print this and next back-to-back. 沿虚线剪开。本页与下一页双面打印。

Flashcards — Back (Definitions)

闪 卡 背 面 — 定 义

Parallel 平行

Lines that never meet, always the same distance apart

永不相交、始终等距的线

Triangle 三角形

A shape with 3 sides; angles sum to 180°

有 3 条边的形状；内角和为 180°

Polygon 多边形

A closed shape with 3 or more straight sides

由 3 条或更多直边围成的封闭形状

Radius 半径

Distance from centre to circumference

从圆心到圆周的距离

Congruent 全等

Same shape and same size

形状相同且大小相同

Similar 相似

Same shape, different size; proportional sides

形状相同、大小不同；边成比例

Print pages 8–9 back-to-back, then cut along dashed lines. 第 8–9 页双面打印，沿虚线剪裁。

Flashcards — Front (More Terms)

闪 卡 正 面 — 更 多 术 语

Bearing

方 位 角

Tangent (line)

切 线

Perimeter

周 长

Area

面 积

Volume

体 积

Surface Area

表 面 积

Cut along dashed lines. Print this and next back-to-back. 沿虚线剪开。本页与下一页双面打印。

Flashcards — Back (Definitions)

闪 卡 背 面 — 定 义

Tangent (line) 切线

A line touching the circle at one point
与圆相切于一点的直线

Bearing 方位角

Direction from North; 000°–360°
从北方顺时针测量的方向角

Area 面积

The amount of space inside a 2D shape
二维图形内部的空间大小

Perimeter 周长

The total distance around a shape
图形外围的总长度

Surface Area 表面积

Total area of all faces of a 3D solid
三维立体所有表面的总面积

Volume 体积

The amount of 3D space a solid occupies
三维立体占据的空间大小

Print pages 10–11 back-to-back, then cut along dashed lines. 第 10–11 页双面打印，沿虚线剪裁。

Flashcards — Front (Even More Terms)

闪 卡 正 面 — 更 多 术 语

Pythagoras' Theorem

勾 股 定 理

Hypotenuse

斜 边

Sine (sin)

正 弦

Cosine (cos)

余 弦

Sine Rule

正 弦 定 理

Cosine Rule

余 弦 定 理

Cut along dashed lines. Print this and next back-to-back. 沿虚线剪开。本页与下一页双面打印。

Flashcards — Back (Definitions)

闪 卡 背 面 — 定 义

Hypotenuse 斜边

The longest side; opposite the right angle

最长边；直角的对边

Pythagoras' Theorem 勾股定理

$a^2 + b^2 = c^2$ for right-angled triangles

直角三角形：$a^2 + b^2 = c^2$

Cosine (cos) 余弦

$$\cos\theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\cos\theta = \frac{\text{邻边}}{\text{斜边}}$$

Sine (sin) 正弦

$$\sin\theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\sin\theta = \frac{\text{对边}}{\text{斜边}}$$

Cosine Rule 余弦定理

$a^2 = b^2 + c^2 - 2bc\cos A$ (any triangle)

$a^2 = b^2 + c^2 - 2bc\cos A$（任意三角形）

Sine Rule 正弦定理

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

Print pages 12–13 back-to-back, then cut along dashed lines. 第 12–13 页双面打印，沿虚线剪裁。