

Tick one box per statement: ☐ not yet ☐ nearly ☐ confident. 每条打一个勾: 尚未掌握 / 快会了 / 有把握。

1. Number

数

C1.1 Types of number 数的类型

- ☐☐☐ Identify and use: • natural numbers • integers (positive, zero and negative) • prime numbers • square numbers • cube numbers • common factors • common multiples • rational and irrational numbers • reciprocals.

C1.2 Sets 集合

- ☐☐☐ Understand and use set language, notation and Venn diagrams to describe sets.

C1.3 Powers and roots 幂与根

- ☐☐☐ Calculate with the following: • squares • square roots • cubes • cube roots • other powers and roots of numbers.

C1.4 Fractions, decimals and percentages 分数、小数与百分数

- ☐☐☐ Use the language and notation of the following in appropriate contexts: • proper fractions • improper fractions • mixed numbers • decimals • percentages.
- ☐☐☐ Recognise equivalence and convert between these forms.

C1.5 Ordering 排序

- ☐☐☐ Order quantities by magnitude and demonstrate familiarity with the symbols $=$, $\neq$, $>$, $<$, $\geq$ and $\leq$.

C1.6 The four operations 四则运算

- ☐☐☐ Use the four operations for calculations with integers, fractions and decimals, including correct ordering of operations and use of brackets.

C1.7 Indices I 指数 I

- ☐☐☐ Understand and use indices (positive, zero and negative integers).
- ☐☐☐ Understand and use the rules of indices.

C1.8 Standard form 标准形式 (科学记数法)

- ☐☐☐ Use the standard form $A \times 10^n$ where n is a positive or negative integer and $1 \leq A < 10$.
- ☐☐☐ Convert numbers into and out of standard form.
- ☐☐☐ Calculate with values in standard form.

C1.9 Estimation 估算

- ☐☐☐ Round values to a specified degree of accuracy.
- ☐☐☐ Make estimates for calculations involving numbers, quantities and measurements.
- ☐☐☐ Round answers to a reasonable degree of accuracy in the context of a given problem.

C1.10 Limits of accuracy 精度范围

- ☐☐☐ Give upper and lower bounds for data rounded to a specified accuracy.

C1.11 Ratio and proportion 比与比例

- ☐☐☐ Understand and use ratio and proportion to:
- ☐☐☐ • give ratios in their simplest form
- ☐☐☐ • divide a quantity in a given ratio
- ☐☐☐ • use proportional reasoning and ratios in context.

C1.12 Rates 比率

- ☐☐☐ Use common measures of rate.
- ☐☐☐ Apply other measures of rate.
- ☐☐☐ Solve problems involving average speed.

C1.13 Percentages 百分数

- ☐☐☐ Calculate a given percentage of a quantity.
- ☐☐☐ Express one quantity as a percentage of another.
- ☐☐☐ Calculate percentage increase or decrease.
- ☐☐☐ Calculate with simple and compound interest.

C1.14 Using a calculator 使用计算器

- ☐☐☐ Use a calculator efficiently.
- ☐☐☐ Enter values appropriately on a calculator.
- ☐☐☐ Interpret the calculator display appropriately.

C1.15 Time 时间

- ☐☐☐ Calculate with time: seconds (s), minutes (min), hours (h), days, weeks, months, years, including the relationship between units.
- ☐☐☐ Calculate times in terms of the 24-hour and 12-hour clock.
- ☐☐☐ Read clocks and timetables.

C1.16 Money 货币

- ☐☐☐ Calculate with money.
- ☐☐☐ Convert from one currency to another.

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- ☐☐☐ Calculate with values in standard form.

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- ☐☐☐ Make estimates for calculations involving numbers, quantities and measurements.
- ☐☐☐ Round answers to a reasonable degree of accuracy in the context of a given problem.

E1.10 Limits of accuracy 精度范围

- ☐☐☐ Give upper and lower bounds for data rounded to a specified accuracy.
- ☐☐☐ Find upper and lower bounds of the results of calculations which have used data rounded to a specified accuracy.

E1.11 Ratio and proportion 比与比例

- ☐☐☐ Understand and use ratio and proportion to:
- ☐☐☐ • give ratios in their simplest form
- ☐☐☐ • divide a quantity in a given ratio
- ☐☐☐ • use proportional reasoning and ratios in context.

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☐☐☐ Express one quantity as a percentage of another.
☐☐☐ Calculate percentage increase or decrease.
☐☐☐ Calculate with simple and compound interest.
☐☐☐ Calculate using reverse percentages.

E1.14 Using a calculator 使用计算器

- ☐☐☐ Use a calculator efficiently.
☐☐☐ Enter values appropriately on a calculator.
☐☐☐ Interpret the calculator display appropriately.

E1.15 Time 时间

- ☐☐☐ Calculate with time: seconds (s), minutes (min), hours (h), days, weeks, months, years, including the relationship between units.
☐☐☐ Calculate times in terms of the 24-hour and 12-hour clock.
☐☐☐ Read clocks and timetables.

E1.16 Money 货币

- ☐☐☐ Calculate with money.
☐☐☐ Convert from one currency to another.

E1.17 Exponential growth and decay 指数增长与衰减

- ☐☐☐ Use exponential growth and decay.

E1.18 Surds 无理根式

- ☐☐☐ Understand and use surds, including simplifying expressions.
☐☐☐ Rationalise the denominator.

2. Algebra and graphs

代数与图像

C2.1 Introduction to algebra 代数导论

- ☐☐☐ Know that letters can be used to represent generalised numbers.
☐☐☐ Substitute numbers into expressions and formulas.

C2.2 Algebraic manipulation 代数式的运算

- ☐☐☐ Simplify expressions by collecting like terms.
☐☐☐ Expand products of algebraic expressions.
☐☐☐ Factorise by extracting common factors.

C2.4 Indices II 指数 II

- ☐☐☐ Understand and use indices (positive, zero and negative).

- ☐☐☐ Understand and use the rules of indices.

C2.5 Equations 方程

- ☐☐☐ Construct simple expressions, equations and formulas.
- ☐☐☐ Solve linear equations in one unknown.
- ☐☐☐ Solve simultaneous linear equations in two unknowns.
- ☐☐☐ Change the subject of simple formulas.

C2.6 Inequalities 不等式

- ☐☐☐ Represent and interpret inequalities, including on a number line.

C2.7 Sequences 数列

- ☐☐☐ Continue a given number sequence or pattern.
- ☐☐☐ Recognise patterns in sequences, including the term-to-term rule, and relationships between different sequences.
- ☐☐☐ Find and use the n th term of the following sequences: (a) linear (b) simple quadratic (c) simple cubic.

C2.9 Graphs in practical situations 实际情境中的图像

- ☐☐☐ Use and interpret graphs in practical situations including travel graphs and conversion graphs.
- ☐☐☐ Draw graphs from given data.

C2.10 Graphs of functions 函数的图像

- ☐☐☐ Construct tables of values, and draw, recognise and interpret graphs for functions of the following forms: • $ax + b$ • $\pm x^2 + ax + b$ • $\frac{a}{x}$ ($x \neq 0$) where a and b are integer constants.
- ☐☐☐ Solve associated equations graphically, including finding and interpreting roots by graphical methods.

C2.11 Sketching curves 草绘曲线

- ☐☐☐ Recognise, sketch and interpret graphs of the following functions: (a) linear (b) quadratic.

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- ☐☐☐ Know that letters can be used to represent generalised numbers.
- ☐☐☐ Substitute numbers into expressions and formulas.

E2.2 Algebraic manipulation 代数式的运算

- ☐☐☐ Simplify expressions by collecting like terms.
- ☐☐☐ Expand products of algebraic expressions.
- ☐☐☐ Factorise by extracting common factors.
- ☐☐☐ Factorise expressions of the form: • $ax + bx + kay + kby$ • $a^2x^2 - b^2y^2$ • $a^2 + 2ab + b^2$ • $ax^2 + bx + c$ • $ax^3 + bx^2 + cx$.
- ☐☐☐ Complete the square for expressions in the form $ax^2 + bx + c$.

E2.3 Algebraic fractions 代数分式

- ☐☐☐ Manipulate algebraic fractions.
- ☐☐☐ Factorise and simplify rational expressions.

E2.4 Indices II 指数 II

- ☐☐☐ Understand and use indices (positive, zero, negative and fractional).
- ☐☐☐ Understand and use the rules of indices.

E2.5 Equations 方程

- ☐☐☐ Construct expressions, equations and formulas.
- ☐☐☐ Solve linear equations in one unknown.
- ☐☐☐ Solve fractional equations with numerical and linear algebraic denominators.
- ☐☐☐ Solve simultaneous linear equations in two unknowns.
- ☐☐☐ Solve simultaneous equations, involving one linear and one non-linear.
- ☐☐☐ Solve quadratic equations by factorisation, completing the square and by use of the quadratic formula.
- ☐☐☐ Change the subject of formulas.

E2.6 Inequalities 不等式

- ☐☐☐ Represent and interpret inequalities, including on a number line.
- ☐☐☐ Construct, solve and interpret linear inequalities.
- ☐☐☐ Represent and interpret linear inequalities in two variables graphically.
- ☐☐☐ List inequalities that define a given region.

E2.7 Sequences 数列

- ☐☐☐ Continue a given number sequence or pattern.
- ☐☐☐ Recognise patterns in sequences, including the term-to-term rule, and relationships between different sequences.
- ☐☐☐ Find and use the n th term of sequences.

E2.8 Proportion 比例

- ☐☐☐ Express direct and inverse proportion in algebraic terms and use this form of expression to find unknown quantities.

E2.9 Graphs in practical situations 实际情境中的图像

- ☐☐☐ Use and interpret graphs in practical situations including travel graphs and conversion graphs.
- ☐☐☐ Draw graphs from given data.
- ☐☐☐ Apply the idea of rate of change to simple kinematics involving distance–time and speed–time graphs, acceleration and deceleration.
- ☐☐☐ Calculate distance travelled as area under a speed–time graph.

E2.10 Graphs of functions 函数的图像

- ☐☐☐ Construct tables of values, and draw, recognise and interpret graphs for functions of the following forms: • ax^n (includes sums of no more than three of these) • $ab^x + c$ where $n = -2, -1, -\frac{1}{2}, 0, \frac{1}{2}, 1, 2, 3$; a and c are rational numbers; and b is a positive integer.

- ☐☐☐ Solve associated equations graphically, including finding and interpreting roots by graphical methods.
- ☐☐☐ Draw and interpret graphs representing exponential growth and decay problems.

E2.11 Sketching curves 草绘曲线

- ☐☐☐ Recognise, sketch and interpret graphs of the following functions: (a) linear (b) quadratic (c) cubic (d) reciprocal (e) exponential.

E2.12 Differentiation 微分

- ☐☐☐ Estimate gradients of curves by drawing tangents.
- ☐☐☐ Use the derivatives of functions of the form ax^n , where a is a rational constant and n is a positive integer or zero, and simple sums of not more than three of these.
- ☐☐☐ Apply differentiation to gradients and stationary points (turning points).
- ☐☐☐ Discriminate between maxima and minima by any method.

E2.13 Functions 函数

- ☐☐☐ Understand functions, domain and range and use function notation.
- ☐☐☐ Understand and find inverse functions $f^{-1}(x)$.
- ☐☐☐ Form composite functions as defined by $gf(x) = g(f(x))$.

3. Coordinate geometry

坐标几何

C3.1 Coordinates 坐标

- ☐☐☐ Use and interpret Cartesian coordinates in two dimensions.

C3.2 Drawing linear graphs 绘制一次函数图像

- ☐☐☐ Draw straight-line graphs for linear equations.

C3.3 Gradient of linear graphs 一次函数图像的斜率

- ☐☐☐ Find the gradient of a straight line.

C3.5 Equations of linear graphs 一次函数图像的方程

- ☐☐☐ Interpret and obtain the equation of a straight-line graph in the form $y = mx + c$.

C3.6 Parallel lines 平行线

- ☐☐☐ Find the gradient and equation of a straight line parallel to a given line.

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- ☐☐☐ Draw straight-line graphs for linear equations.

E3.3 Gradient of linear graphs 一次函数图像的斜率

- ☐☐☐ Find the gradient of a straight line.
- ☐☐☐ Calculate the gradient of a straight line from the coordinates of two points on it.

E3.4 Length and midpoint 长度与中点

- ☐☐☐ Calculate the length of a line segment.
- ☐☐☐ Find the coordinates of the midpoint of a line segment.

E3.5 Equations of linear graphs 一次函数图像的方程

- ☐☐☐ Interpret and obtain the equation of a straight-line graph.

E3.6 Parallel lines 平行线

- ☐☐☐ Find the gradient and equation of a straight line parallel to a given line.

E3.7 Perpendicular lines 垂直线

- ☐☐☐ Find the gradient and equation of a straight line perpendicular to a given line.

4. Geometry

几何

C4.1 Geometrical terms 几何术语

- ☐☐☐ Use and interpret the following geometrical terms: • point • vertex • line • parallel • perpendicular • bearing • right angle • acute, obtuse and reflex angles • interior and exterior angles • similar • congruent • scale factor.
- ☐☐☐ Use and interpret the vocabulary of: • triangles • special quadrilaterals • polygons • nets • simple solids.
- ☐☐☐ Use and interpret the vocabulary of a circle.

C4.2 Geometrical constructions 几何作图

- ☐☐☐ Measure and draw lines and angles.
- ☐☐☐ Construct a triangle, given the lengths of all sides, using a ruler and pair of compasses only.
- ☐☐☐ Draw, use and interpret nets.

C4.3 Scale drawings 比例尺作图

- ☐☐☐ Draw and interpret scale drawings.
- ☐☐☐ Use and interpret three-figure bearings.

C4.4 Similarity 相似

- ☐☐☐ Calculate lengths of similar shapes.

C4.5 Symmetry 对称

- ☐☐☐ Recognise line symmetry and order of rotational symmetry in two dimensions.

C4.6 Angles 角

- ☐☐☐ Calculate unknown angles and give simple explanations using the following geometrical properties: • sum of angles at a point = 360° • sum of angles at a point on a straight line =

180° • vertically opposite angles are equal • angle sum of a triangle = 180° and angle sum of a quadrilateral = 360°.

- ☐☐☐ Calculate unknown angles and give geometric explanations for angles formed within parallel lines:
 - corresponding angles are equal • alternate angles are equal • co-interior angles sum to 180° (supplementary).
- ☐☐☐ Know and use angle properties of regular polygons.

C4.7 Circle theorems 圆的定理

- ☐☐☐ Calculate unknown angles and give explanations using the following geometrical properties of circles:
 - angle in a semicircle = 90° • angle between tangent and radius = 90°.

E4.1 Geometrical terms 几何术语

- ☐☐☐ Use and interpret the following geometrical terms:
 - point • vertex • line • plane • parallel • perpendicular • perpendicular bisector • bearing • right angle • acute, obtuse and reflex angles • interior and exterior angles • similar • congruent • scale factor.
- ☐☐☐ Use and interpret the vocabulary of:
 - triangles • special quadrilaterals • polygons • nets • solids.
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E4.4 Similarity 相似

- ☐☐☐ Calculate lengths of similar shapes.
- ☐☐☐ Use the relationships between lengths and areas of similar shapes and lengths, surface areas and volumes of similar solids.
- ☐☐☐ Solve problems and give simple explanations involving similarity.

E4.5 Symmetry 对称

- ☐☐☐ Recognise line symmetry and order of rotational symmetry in two dimensions.
- ☐☐☐ Recognise symmetry properties of prisms, cylinders, pyramids and cones.

E4.6 Angles 角

- ☐☐☐ Calculate unknown angles and give simple explanations using the following geometrical properties:
 - sum of angles at a point = 360° • sum of angles at a point on a straight line = 180° • vertically opposite angles are equal • angle sum of a triangle = 180° and angle sum of a quadrilateral = 360°.
- ☐☐☐ Calculate unknown angles and give geometric explanations for angles formed within parallel lines:
 - corresponding angles are equal • alternate angles are equal • co-interior angles sum to 180° (supplementary).

☐☐☐ Know and use angle properties of regular and irregular polygons.

E4.7 Circle theorems I 圆的定理 I

☐☐☐ Calculate unknown angles and give explanations using the following geometrical properties of circles: • angle in a semicircle = 90° • angle between tangent and radius = 90° • angle at the centre is twice the angle at the circumference • angles in the same segment are equal • opposite angles of a cyclic quadrilateral sum to 180° (supplementary) • alternate segment theorem.

E4.8 Circle theorems II 圆的定理 II

☐☐☐ Use the following symmetry properties of circles: • equal chords are equidistant from the centre • the perpendicular bisector of a chord passes through the centre • tangents from an external point are equal in length.

5. Mensuration

测量

C5.1 Units of measure 度量单位

☐☐☐ Use metric units of mass, length, area, volume and capacity in practical situations and convert quantities into larger or smaller units.

C5.2 Area and perimeter 面积与周长

☐☐☐ Carry out calculations involving the perimeter and area of a rectangle, triangle, parallelogram and trapezium.

C5.3 Circles, arcs and sectors 圆、弧与扇形

☐☐☐ Carry out calculations involving the circumference and area of a circle.
☐☐☐ Carry out calculations involving arc length and sector area as fractions of the circumference and area of a circle, where the sector angle is a factor of 360° .

C5.4 Surface area and volume 表面积与体积

☐☐☐ Carry out calculations and solve problems involving the surface area and volume of a: • cuboid • prism • cylinder • sphere • pyramid • cone.

C5.5 Compound shapes and parts of shapes 复合图形与图形的部分

☐☐☐ Carry out calculations and solve problems involving perimeters and areas of: • compound shapes • parts of shapes.
☐☐☐ Carry out calculations and solve problems involving surface areas and volumes of: • compound solids • parts of solids.

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- ☐☐☐ Carry out calculations involving the circumference and area of a circle.
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- ☐☐☐ Carry out calculations and solve problems involving the surface area and volume of a: • cuboid • prism • cylinder • sphere • pyramid • cone.

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- ☐☐☐ Carry out calculations and solve problems involving perimeters and areas of: • compound shapes • parts of shapes.
- ☐☐☐ Carry out calculations and solve problems involving surface areas and volumes of: • compound solids • parts of solids.

6. Trigonometry

三角学

C6.1 Pythagoras' theorem 勾股定理

- ☐☐☐ Know and use Pythagoras' theorem.

C6.2 Right-angled triangles 直角三角形

- ☐☐☐ Know and use the sine, cosine and tangent ratios for acute angles in calculations involving sides and angles of a right-angled triangle.
- ☐☐☐ Solve problems in two dimensions using Pythagoras' theorem and trigonometry.

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- ☐☐☐ Solve problems in two dimensions using Pythagoras' theorem and trigonometry.
- ☐☐☐ Know that the perpendicular distance from a point to a line is the shortest distance to the line.
- ☐☐☐ Carry out calculations involving angles of elevation and depression.

E6.3 Exact trigonometric values 三角函数的精确值

- ☐☐☐ Know the exact values of: $1 \sin x$ and $\cos x$ for $x = 0^\circ, 30^\circ, 45^\circ, 60^\circ$ and 90° . $2 \tan x$ for $x = 0^\circ, 30^\circ, 45^\circ$ and 60° .

E6.4 Trigonometric functions 三角函数

- ☐☐☐ Recognise, sketch and interpret the following graphs for $0^\circ \leq x \leq 360^\circ$: • $y = \sin x$ • $y = \cos x$ • $y = \tan x$.
- ☐☐☐ Solve trigonometric equations involving $\sin x$, $\cos x$ or $\tan x$, for $0^\circ \leq x \leq 360^\circ$.

E6.5 Non-right-angled triangles 非直角三角形

- ☐☐☐ Use the sine and cosine rules in calculations involving lengths and angles for any triangle.

☐☐☐ Use the formula area of triangle = $\frac{1}{2}ab \sin C$.

E6.6 Pythagoras' theorem and trigonometry in 3D 三维中的勾股定理与三角学

☐☐☐ Carry out calculations and solve problems in three dimensions using Pythagoras' theorem and trigonometry, including calculating the angle between a line and a plane.

7. Transformations and vectors

变换与向量

C7.1 Transformations 变换

- ☐☐☐ Recognise, describe and draw the following transformations:
- ☐☐☐ Reflection of a shape in a vertical or horizontal line.
- ☐☐☐ Rotation of a shape about the origin, vertices or midpoints of edges of the shape, through multiples of 90° .
- ☐☐☐ Enlargement of a shape from a centre by a scale factor.
- ☐☐☐ Translation of a shape by a vector $\begin{pmatrix} x \\ y \end{pmatrix}$.

E7.1 Transformations 变换

☐☐☐ Transformations

E7.2 Vectors in two dimensions 二维向量

☐☐☐ Vectors in two dimensions

E7.3 Magnitude of a vector 向量的模

☐☐☐ Magnitude of a vector

E7.4 Vector geometry 向量几何

☐☐☐ Vector geometry

8. Probability

概率

C8.1 Introduction to probability 概率导论

- ☐☐☐ Understand and use the probability scale from 0 to 1.
- ☐☐☐ Calculate the probability of a single event.
- ☐☐☐ Understand that the probability of an event not occurring = $1 -$ the probability of the event occurring.

C8.2 Relative and expected frequencies 相对频率与期望频率

- ☐☐☐ Understand relative frequency as an estimate of probability.
- ☐☐☐ Calculate expected frequencies.

C8.3 Probability of combined events 组合事件的概率

- ☐☐☐ Calculate the probability of combined events using, where appropriate:
 - sample space diagrams
 - Venn diagrams
 - tree diagrams.

E8.1 Introduction to probability 概率导论

- ☐☐☐ Understand and use the probability scale from 0 to 1.
- ☐☐☐ Understand and use probability notation.
- ☐☐☐ Calculate the probability of a single event.
- ☐☐☐ Understand that the probability of an event not occurring = $1 -$ the probability of the event occurring.

E8.2 Relative and expected frequencies 相对频率与期望频率

- ☐☐☐ Understand relative frequency as an estimate of probability.
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- ☐☐☐ Calculate the probability of combined events using, where appropriate:
 - sample space diagrams
 - Venn diagrams
- ☐☐☐ • tree diagrams.

E8.4 Conditional probability 条件概率

- ☐☐☐ Calculate conditional probability using Venn diagrams, tree diagrams and tables.

9. Statistics

统计

C9.1 Classifying statistical data 统计数据的分类

- ☐☐☐ Classify and tabulate statistical data.

C9.2 Interpreting statistical data 统计数据的解读

- ☐☐☐ Read, interpret and draw inferences from tables and statistical diagrams.
- ☐☐☐ Compare sets of data using tables, graphs and statistical measures.
- ☐☐☐ Appreciate restrictions on drawing conclusions from given data.

C9.3 Averages and range 平均数与极差

- ☐☐☐ Calculate the mean, median, mode and range for individual data and distinguish between the purposes for which these are used.

C9.4 Statistical charts and diagrams 统计图表

- ☐☐☐ Draw and interpret: (a) bar charts (b) pie charts (c) pictograms (d) stem-and-leaf diagrams (e) simple frequency distributions.

C9.5 Scatter diagrams 散点图

- ☐☐☐ Draw and interpret scatter diagrams.
- ☐☐☐ Understand what is meant by positive, negative and zero correlation.
- ☐☐☐ Draw by eye, interpret and use a straight line of best fit.

E9.1 Classifying statistical data 统计数据的分类

- ☐☐☐ Classify and tabulate statistical data.

E9.2 Interpreting statistical data 统计数据的解读

- ☐☐☐ Read, interpret and draw inferences from tables and statistical diagrams.
- ☐☐☐ Compare sets of data using tables, graphs and statistical measures.
- ☐☐☐ Appreciate restrictions on drawing conclusions from given data.

E9.3 Averages and measures of spread 平均数与离散程度的度量

- ☐☐☐ Calculate the mean, median, mode, quartiles, range and interquartile range for individual data and distinguish between the purposes for which these are used.
- ☐☐☐ Calculate an estimate of the mean for grouped discrete or grouped continuous data.
- ☐☐☐ Identify the modal class from a grouped frequency distribution.

E9.4 Statistical charts and diagrams 统计图表

- ☐☐☐ Draw and interpret: (a) bar charts (b) pie charts (c) pictograms (d) stem-and-leaf diagrams (e) simple frequency distributions.

E9.5 Scatter diagrams 散点图

- ☐☐☐ Draw and interpret scatter diagrams.
- ☐☐☐ Understand what is meant by positive, negative and zero correlation.
- ☐☐☐ Draw by eye, interpret and use a straight line of best fit.

E9.6 Cumulative frequency diagrams 累积频数图

- ☐☐☐ Draw and interpret cumulative frequency tables and diagrams.
- ☐☐☐ Estimate and interpret the median, percentiles, quartiles and interquartile range from cumulative frequency diagrams.

E9.7 Histograms 直方图

- ☐☐☐ Draw and interpret histograms.
- ☐☐☐ Calculate with frequency density.