CHAPTER 4 LEARNING TARGETS AND OBJECTIVES

4.1 An Overview of Learning Targets

4.1.1 Number and Algebra Dimension

Key Stage 3 (S1 - S3)		Key Stage 4 (S4 - S5)
To develop students an ever-improving capability to • extend the concepts of numbers to rational and irrational numbers; • develop various strategies in using numbers to formulate and solve problems, and to examine results; • develop and refine strategies for estimating; • extend the use of algebraic symbols in communicating mathematical ideas; • explore and describe patterns of sequences of numbers using algebraic symbols; • interpret simple algebraic relations from numerical, symbolic and graphical perspectives; • manipulate algebraic expressions and relations; and apply these knowledge and skills to formulate and solve simple practical problems and to examine results; and • apply the knowledge and skills of the Number and Algebra Dimension to formulate and solve a variety of practical problems in various Learning Dimensions.		To develop students an ever-improving capability to • understand the real number system; • investigate and describe relationships between quantities using algebraic symbols and relations; • generalize and describe patterns of sequences of numbers using algebraic symbols; and apply the results to solve problems; • interpret more complex algebraic relations from numerical, symbolic and graphical perspectives; • manipulate more complex algebraic expressions and relations, and apply these knowledge and skills to formulate and solve a variety of practical problems and justify the validity of results; and • apply the knowledge and skills in the Number and Algebra Dimension to generalize, describe and communicate mathematical ideas and solve further problems in various Learning Dimensions.

4.1.2 Measures, Shape and Space Dimension

Key Stage 3 (S1 - S3)		Key Stage 4 (S4 - S5)
To develop students an ever-improving capability to • understand the nature of measurement and be aware of the issues about precision and accuracy; • apply a variety of techniques, tools and formulas for measurements and solving mensuration problems; • explore and visualize geometric properties of 2-dimensional and 3-dimensional objects intuitively; • use inductive reasoning, deductive reasoning and analytic approach to study the properties of 2-dimensional rectilinear shapes; • formulate and write simple geometric proofs involving 2-dimensional rectilinear shapes with appropriate symbols, terminology and reasons; • inquire, describe and represent geometric knowledge in 2-dimensional figures using numeric and algebraic relations; • inquire geometric knowledge in 2-dimensional space using trigonometric relations; and • interconnect the knowledge and skills of the Measures, Shape and Space Dimension and other Learning Dimensions, and apply them to formulate and solve 2-dimensional problems.		To develop students an ever-improving capability to • use and select inductive reasoning, deductive reasoning or analytic approach to study the properties of 2-dimensional shapes; • formulate and write geometric proofs involving 2-dimensional shapes with appropriate symbols, terminology and reasons; • inquire, describe and represent geometric knowledge in 2-dimensional space using algebraic relations; • inquire, describe and represent geometric knowledge in 2-dimensional and 3-dimensional space using trigonometric functions; and • interconnect the knowledge and skills of the Measures, Shape and Space Dimension and other Learning Dimensions, and apply them to formulate and solve 2-dimensional and 3-dimensional problems with various strategies.

4.1.3 Data Handling Dimension

Key Stage 3 (S1 - S3)		Key Stage 4 (S4 - S5)
To develop students an ever-improving capability to • understand the criteria for organizing discrete and continuous statistical data; • choose and construct appropriate statistical diagrams and graphs to represent given data and interpret them; • find, interpret and select the measure to describe the central tendency of a set of data; • judge the appropriateness of the methods used in handling statistical data; • understand the notion of probability and handle simple probability problems by listing and drawing diagrams; and • inquire and solve statistical and probability problems with appropriate strategies.		To develop students an ever-improving capability to • understand and compute the measures of dispersion; • select and use the measures of central tendency and dispersion to compare data sets; • investigate and judge the validity of arguments derived from the data set; • formulate and solve further probability problems by applying simple laws; and • integrate the knowledge in statistics and probability to solve real life problems.