

IMMANUEL LUTHERAN COLLEGE
S4 NSS Mathematics Teaching Schedule (2009 - 2010)

Textbook: New Century Mathematics – Book 4A, 4B (Oxford)

Teachers:

| | | | | | |
|----------------|----------------|-----------------|----------------|----------------|----------------|
| Class A | Class B | Class C | Class D | Class E | Class F |
| Ho KC | Ho KC | Young KM | Lok CF | Chan KF | Lo SK |

Schedule:

4A Chapter 1 – Number Systems

| Date | Objectives | Content | Periods | Teaching Materials / Ex./ Remarks |
|-------------------------|---|--------------------------------------|---------|-----------------------------------|
| 2 sept to 11 sept | <ul style="list-style-type: none"> ● Appreciate the development of the number systems including the system of complex numbers ● Perform addition, subtraction, multiplication and division of complex numbers | Real number system | 4 | Exercise 1A |
| | | Complex Numbers | | |
| | | Simple Arithmetic of Complex Numbers | 4 | Exercise 1B |
| | | Total: | 8 | |

4A Chapter 3 – Quadratic Equations in One Unknown

| Date | Objectives | Content | Periods | Teaching Materials / Ex./ Remarks |
|------------------------|---|--|---------|-----------------------------------|
| 14 sept to 7 oct | <ul style="list-style-type: none"> ● Solve quadratic equations by the factor method ● Solve the equation $ax^2 + bx + c = 0$ by plotting the graph of the parabola $y = ax^2 + bx + c$ and reading the x-intercepts ● Solve quadratic equations by the quadratic formula ● Understand the relations between the discriminant of a quadratic equation and the nature of its roots ● Solve problems involving quadratic equations | Review – Factorization | 1 | |
| | | Solving Quadratic Equations by the factor Method | 2 | Exercise 3A |
| | | Graphical Method | 2 | Exercise 3B |
| | | Quadratic Formula | 2 | Exercise 3C |
| | | Discriminant and the Nature of Roots | 2 | Exercise 3D |
| | | Problems Leading to Quadratic Equations | 2 | Exercise 3E |

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|--|--|--|----|-------------|
| | <ul style="list-style-type: none"> Form quadratic equations from given roots. Understand the relations between the roots and coefficients and form quadratic equations using these relations | Forming Quadratic Equations | 2 | Exercise 3F |
| | | Relations between Roots and Coefficients | 2 | Exercise 3G |
| | | Total: | 15 | |

Quiz (1) – Lo SK

4A Chapter 4 – Basic Knowledge of Functions

| Date | Objectives | Content | Periods | Teaching Materials / Ex./ Remarks |
|-----------------|---|------------------------------|---------|-----------------------------------|
| 8 oct to 20 oct | <ul style="list-style-type: none"> Recognize the intuitive concepts of functions, domains and co-domains, independent and dependent variables Recognize the notation of functions and use tabular, algebraic and graphical methods to represent functions | Basic Concept of Functions | 2 | Exercise 4A |
| | | Representations of Functions | 2 | |
| | | Notation of a Function | 4 | Exercise 4B |
| | | Total: | 8 | |

First Term Uniform Test – Lok CF

4A Chapter 5 – Quadratic Functions

| Date | Objectives | / Content | Periods | Teaching Materials / Ex./ Remarks |
|-----------------|--|---|---------|-----------------------------------|
| 21 oct to 6 nov | <ul style="list-style-type: none"> Understand the features of the graphs of quadratic functions Find the maximum and minimum values of quadratic functions by the algebraic method | Features of the Graphs of Quadratic Functions | 2 | Exercise 5A |
| | | Completing | 2 | Exercise 5B |
| | | Exploring the Properties of Quadratic Functions Using Completing the Square | 2 | |
| | | Application Problems | 2 | |
| | | Total: | 8 | |

4A Chapter 6 – More About Polynomials

| Date | Objectives | / Content | Periods | Teaching Materials / Ex./ Remarks |
|-----------------------|--|-------------------------|---------|--------------------------------------|
| 7 nov to 22 nov | <ul style="list-style-type: none"> ● Perform division of polynomials ● Understand the remainder theorem ● Understand the factor theorem | Division of Polynomials | 2 | Exercise 6A |
| | | Remainder Theorem | 3 | Exercise 6B |
| | | Factor Theorem | 4 | Exercise 6C |
| | | Application Problems | 2 | Exercise 5B |
| | | Total: | 9 | |

Quiz (2) – Chan KF**4A Chapter 2 – Equations of Straight Lines**

| Date | Objectives | Content | Periods | Teaching Materials / Ex./ Remarks |
|-----------------------|---|--|---------|--------------------------------------|
| 23 nov to 5 jan | <ul style="list-style-type: none"> ● Understand the equation of a straight line: <ul style="list-style-type: none"> ■ Find the equation of a straight line from given conditions ■ Describe the features of a straight line from its equation ● Understand the possible intersection of two straight lines | Review | 3 | Exercise 2A |
| | | Two-point form, Point slope form | 3 | |
| | | Slope-intercept form, intercept form | 3 | Exercise 2B |
| | | Equations of Special Straight Lines | 2 | |
| | | Number of Points of Intersection of Two Straight lines | 3 | |
| | | Summary | 2 | Supp. Exercise 2 |
| | | Total: | 16 | |

First Term Exam – (I) Lok CF, (II) Chan KF

| Date | Objectives | Content | Periods | Teaching Materials / Ex./ Remarks |
|------------------------|-----------------|-----------------------------|---------|--------------------------------------|
| 19 jan to 20 jan | ● Checking Days | First Term exam checking | 4 | |
| | | Total: | 4 | |

4B Chapter 10 – Rational Functions

| Date | Objectives | Content | Periods | Teaching Materials / Ex./ Remarks |
|-----------------------|--|---|---------|--------------------------------------|
| 21 jan to 5 feb | <ul style="list-style-type: none"> ● Understand the concepts for the greatest common divisor and the least common multiple of polynomials ● Perform addition, subtraction, multiplication and division of rational functions | Highest Common Factor and Least Common Multiple | 4 | Exercise 10A |
| | | Addition and Subtraction of Rational Functions | 3 | Exercise 10B |
| | | Multiplication and Division of Rational Functions | 5 | Exercise 10C |
| | | Total: | 12 | |

4B Chapter 8 – Exponential Functions

| Date | Objectives | Content | Periods | Teaching Materials / Ex./ Remarks |
|----------------------|--|--|---------|--------------------------------------|
| 8 feb to 1 mar | <ul style="list-style-type: none"> ● Understand the definitions of rational indices ● Understand the laws of rational indices ● Understand the properties of exponential functions and recognize the features of their graphs | Review – law of indices | 2 | Exercise 8A |
| | | Rational Indices | 2 | |
| | | Exponential Functions and their Graphs | 3 | Exercise 8B |
| | | Application of Exponential Functions | 3 | |
| | | Total: | 10 | |

Quiz (3) –Ho KC

4B Chapter 9 – Logarithmic Functions

| Date | Objectives | Content | Periods | Teaching Materials / Ex./ Remarks |
|-----------------------|--|---|---------|--|
| 2 mar to 24 mar | <ul style="list-style-type: none"> ● Understand the definition and properties of logarithms (including the change of base) ● Understand the properties of logarithmic functions and recognize the features of their graphs ● Solve exponential equations and logarithmic equations ● Appreciate the applications of logarithms in real-life situations ● Appreciate the development of the concepts of logarithms | Definition of Logarithms | 2 | Exercise 9A Exercise 9B Exercise 9C Exercise 9D |
| | | Properties of Logarithms | 3 | |
| | | Find the Values of Logs using a Calculator | 2 | |
| | | Logarithmic Functions and Their Graphs | 3 | |
| | | Exponential Equations and Logarithmic Equations | 4 | |
| | | Applications of Logarithms | 2 | |
| | | Total: | 16 | |

Second Term Uniform Test –Young KM**4B Chapter 11 – Basis Properties of Circles**

| Date | Objectives | Content | Periods | Teaching Materials / Ex./ Remarks |
|------------------------|---|---|---------|--|
| 25 mar to 30 apr | <ul style="list-style-type: none"> ● Understand the properties of chords of a circle ● Understand the properties of angles of a circle ● Understand the properties of arcs of a circle | Review – Basic Geometry | 2 | Exercise 11A Exercise 11B Exercise 11C |
| | | Basic Knowledge about Circles | 2 | |
| | | Properties of Chords of a Circle | 2 | |
| | | Angle Properties of a Circle | 3 | |
| | | Relationships among Angles, Arcs and Chords | 3 | |
| | | Total: | 12 | |

4B Chapter 12 – More about Basic Properties of Circles

| Date | Objectives | Content | Periods | Teaching Materials / Ex./ Remarks |
|-----------------|--|---|---------|-----------------------------------|
| 3 may to 14 may | <ul style="list-style-type: none"> ● Understand the properties of a cyclic quadrilateral ● Understand the tests for concyclic points and cyclic quadrilaterals ● Understand the properties of tangents to a circle ● Understand the properties of angles in the alternate segments ● Use the basic properties of circles to perform simple geometric proofs | Properties of Cyclic Quadrilaterals | 2 | Exercise 12A |
| | | Tests for Cyclic Quadrilaterals | 2 | Exercise 12B |
| | | Basic Properties of Tangents to Circles | 2 | Exercise 12C |
| | | Tangents from an External Point | 2 | Exercise 12D |
| | | Angles in Alternate Segments | 2 | Exercise 12E |
| | | Geometric Proofs on Circles | 2 | Exercise 12F |
| | | Total: | 12 | |

Quiz (4) – Young KM**4B Chapter 13 – Basic Trigonometry**

| Date | Objectives | Content | Periods | Teaching Materials / Ex./ Remarks |
|-----------------|---|-----------------------------------|---------|-----------------------------------|
| 17 may to 4 jan | <ul style="list-style-type: none"> ● Understand the functions sine, cosine and tangent ● Understand the graphs of sine, cosine and tangent and their properties, including maximum and minimum values and periodicity ● Solve the trigonometric equations $a \sin x = b$, $a \cos x = b$, $a \tan x = b$ ● Solve other trigonometric equations | Trigonometric Ratios of Any Angle | 2 | Exercise 13A |
| | | Signs of Trigonometric Ratios | 2 | |
| | | Trigonometric Identities | 2 | Exercise 13B |
| | | Transformation formula | 1 | |
| | | Graphs of Trigonometric Functions | 3 | Exercise 13C |
| | | Solving Trigonometric Equations | 4 | |
| | | Total: | 14 | |

Second Term Examination – (I) Lo SK, (II) Ho KC

~End of Schedule~