

**Immanuel Lutheran College**  
**S.1 Mathematics Course Outline (2010 – 2011)**

Date	Content	No. of periods
2/9/2010 – 17/9	<b>BK.1A Chapter 1</b> <b>Directed Numbers</b>	14
20/9 – 8/10	BK.1A Chapter 2 Basic Algebra	14
8/10	Quiz 1: Ch 1-2	30 minutes
11/10 – 26/10	<b>BK.1A Chapter 3</b> <b>Basic Geometry</b>	14
27/10 – 1/11	Uniform test 1: chapters 1, 2, 3	45 minutes
2/11 – 17/11	BK.1A Chapter 4 Linear Equations in One Unknown	14
18/11 – 30/11	<b>BK.1B Chapter 8</b> Symmetry and Transformation	9
6/12	Quiz 2: Ch 4,8	30 minutes
1/12 – 7/12	<b>BK.1A Chapter 6</b> <b>Statistics in Daily Life</b>	6
8/12 – 5/1/2011	BK.1B Chapter 10 Statistical Graphs	10
6/1 – 18/1/11	<b>Exam 1: Chapters 1,2, 3, 4, 6, 8, 10</b>	60 minutes
19/1 – 17/2	<b>Chapter 7</b> Algebraic Expressions and Polynomials	14
21/2 – 4/3	BK.1B Chapter 12 <b>Ratio and Rate</b>	12
8/3	Quiz 3: Ch 7, 12	30 minutes
7/3 – 28/3	<b>BK.1B Chapter 13.1, 13.2</b> Angles in Rectilinear Figures	8
29/3 – 1/4	<b>Uniform Test 2: chapters 7, 12, 13.1, 13.2</b>	45 minutes
4/4 – 11/4	<b>BK. 2A Chapter 1</b> Estimation and Approximation	8
14/4 – 13/5	BK.1A Chapter 5 Percentages	14
20/5	Quiz 4: Ch 1, 5	30 minutes
16/5 – 27/5	BK.1B Chapter 9 <b>Introduction to Coordinates</b>	12
30/5 – 8/6	<b>BK.1B Chapter 13.3, 13.4</b> <b>Angles in Rectilinear Figures</b>	8
9/6 – 22/6	Exam 2: Chapters 5, 7, 9, 12, 13 BK 2A Ch1	60 minutes

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2/9/2010 – 17/9	<b>BK.1A Chapter 1</b> <b>Directed Numbers</b>	14
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11/10 – 26/10	<b>BK.1A Chapter 3</b> <b>Basic Geometry</b>	14
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2/11 – 17/11	BK.1A Chapter 4 Linear Equations in One Unknown	14
18/11 – 30/11	<b>BK.1B Chapter 8</b> Symmetry and Transformation	9
6/12	Quiz 2: Ch 4,8	30 minutes
1/12 – 7/12	<b>BK.1A Chapter 6</b> <b>Statistics in Daily Life</b>	6
8/12 – 5/1/2011	BK.1B Chapter 10 Statistical Graphs	10
6/1 – 18/1/11	<b>Exam 1: Chapters 1,2, 3, 4, 6, 8, 10</b>	60 minutes
19/1 – 17/2	<b>Chapter 7</b> Algebraic Expressions and Polynomials	14
21/2 – 4/3	BK.1B Chapter 12 <b>Ratio and Rate</b>	12
8/3	Quiz 3: Ch 7, 12	30 minutes
7/3 – 28/3	<b>BK.1B Chapter 13.1, 13.2</b> Angles in Rectilinear Figures	8
29/3 – 1/4	<b>Uniform Test 2: chapters 7, 12, 13.1, 13.2</b>	45 minutes
4/4 – 11/4	<b>BK. 2A Chapter 1</b> Estimation and Approximation	8
14/4 – 13/5	BK.1A Chapter 5 Percentages	14
20/5	Quiz 4: Ch 1, 5	30 minutes
16/5 – 27/5	BK.1B Chapter 9 <b>Introduction to Coordinates</b>	12
30/5 – 8/6	<b>BK.1B Chapter 13.3, 13.4</b> <b>Angles in Rectilinear Figures</b>	8
9/6 – 22/6	Exam 2: Chapters 5, 7, 9, 12, 13 BK 2A Ch1	60 minutes

**S.1A Chapter 0 The Art of Mathematical Thinking (1)**

**Teaching Objective**

- To let students know the steps of solving problems.
- To let students know the different strategies for solving problems: act it out, trial and error, look for a pattern, simplify the problem, draw a diagram, work backwards.

**Teaching Schedule**

Date	Contents	Suggested Teaching Period	Exercise
2/9/2010 – 4/9/2010	Title page 0.1 Problem-solving A. Introduction B. Steps of solving problems 0.2 Problem-solving Strategies A. Act it out B. Trial and error C. Look for a pattern D. Simplify the problem E. Draw a diagram F. Work backwards	1  2	Exercise 0 (page 0.7)

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IMMANUEL LUTHERAN COLLEGE  
S.1 Mathematics Scheme of Work (2010-2011)  
**S.1A Chapter 1 Directed Numbers**

**Teaching Objective**

- To let students understand and apply the concept of negative numbers.
- To let students know the concept of the order of numbers on a number line.
- To let students handle the operations of directed numbers.

**Teaching Schedule**

Date	Contents	Suggested Teaching Period	Exercise
5/9/2010 – 17/9/2010	1.1 Positive and Negative Numbers  1.2 Directed Numbers and Number Lines A. Number lines B. Order  1.3 Addition and Subtraction of Directed Numbers A. Adding or subtracting positive numbers B. Adding or subtracting negative numbers  1.4 Mixed Addition and Subtraction of Directed Numbers  1.5 Multiplication and Division of Directed Numbers A. Multiplication of directed numbers B. Division of directed numbers  Chapter Summary	1  2  2  2 2  2	Exercise 1A (page 1.5) Exercise 1B (page 1.13)  Exercise 1C (page 1.24)  Exercise 1D (page 1.27) Exercise 1E (page 1.35)  Check Yourself (page 1.38) Revision Exercise 1 (page 1.40)

**Teaching Objective**

- To appreciate the use of letters to represent numbers.
- To let students rewrite text into algebraic expressions and use text to describe algebraic expressions.
- To let students note the differences between algebraic expressions and arithmetic expressions.
- To let students recognize some common formulae and make use of substitution.
- To investigate the patterns of various number sequences, including square sequences, triangular sequences, arithmetic sequences, geometric sequences and Fibonacci sequences.
- To let students use algebraic expressions to represent the  $n$  th term of a number sequence.

**Teaching Schedule**

Date	Contents	Suggested Teaching Period	Exercise
20/9/2010 – 8/10/2010	2.1 Understanding Algebra A. Introduction B. Algebraic notations and operations	4	Exercise 2A (page 2.10)
	2.2 Formulae and Substitution		Exercise 2B (page 2.16)
	2.3 Sequences A. Introduction B. Some common sequences	3	Exercise 2C (page 2.26)
	2.4 The $n$ th Term of a Sequence	2	Exercise 2D (page 2.30)
	Chapter Summary	1	Check Yourself (page 2.33) Revision Exercise 2 (page 2.34)
			<u>14</u>

**Quiz 1 (30 minutes): Chapters 1, 2 ; setter: Young KM**

**Bk. 1A Chapter 3 Basic Geometry**

**Teaching Objective**

- To let students know the common terms and notations in geometry, such as points, lines (segments), planes, solids, angles, regular polygons and regular polyhedra.
- To let students identify different types of angles and polygons.
- To let students know the properties of solids, such as Euler’s formula.
- To draw 2-D representations of simple solids and cross-sections of solids.
- To use drawing tools, such as rulers, compasses and set squares, to draw polygons, circles, parallel lines and perpendicular lines.

**Teaching Schedule**

Date	Contents	Suggested Teaching Period	Exercise
11/10/2010 – 26/10/2010	3.1 Points and Lines 3.2 Angles 3.3 The Use of Protractor 3.4 Triangles 3.5 Polygons 3.6 Solids 3.7 2-Dimensional Representations of Solids 3.8 Drawing Tools Chapter Summary	1 1 1 2 2 2 2 1 2	Exercise 3A (page 3.8) Exercise 3B (page 3.13) Exercise 3C (page 3.19) Exercise 3D (page 3.26) Exercise 3E (page 3.32) Exercise 3F (page 3.39) Check Yourself (page 3.42) Revision Exercise 3 (page 3.44)

14

**UT 1 (45 minutes): Chapters 1, 2, 3 ; setter: Young KM**

### Bk. 1A Chapter 4 Linear Equation in One Unknown

#### Teaching Objective

- To let students master the techniques of solving linear equations in one unknown.
- To get answers to daily-life problems by setting up and solving linear equations in one unknown.

#### Teaching Schedule

Date	Contents	Suggested Teaching Period	Exercise
2/11/2010 – 17/11/2010	4.1 Concept of Equation 4.2 Techniques of Solving Equations A. Combining unknowns B. Removing brackets C. Technique of eliminating denominators  4.3 Solving Problems by Using Linear Equations in One Unknown A. Setting up linear equations in one unknown B. Solving problems by using equations  Chapter Summary	3 3  4  4	Exercise 4A (page 4.8) Exercise 4B (page 4.12)  Exercise 4C (page 4.20)  Check Yourself (page 4.23) Revision Exercise 4 (page 4.23)

14

**Bk. 1B Chapter 8 Symmetry and Transformation**

**Teaching Objective**

- To let students know plane figures with the property of reflectional symmetry or rotational symmetry.
- To let students know the effects of transformation including translation, reflection, rotation and enlargement/contraction on plane figures.
- To appreciate symmetry and transformation in our daily life.

**Teaching Schedule**

Cycle/ Date	Contents	Suggested Teaching Period	Exercise
18/11/2010 – 30/11/2010	8.1 Symmetry A. Reflectional symmetry B. Rotational symmetry 8.2 Transformation A. Translation B. Reflection C. Rotation D. Enlargement/Contraction  Chapter Summary	3  5  1	Exercise 8A (page 8.7)  Exercise 8B (page 8.13) Exercise 8C (page 8.19)  Check Yourself (page 8.22) Revision Exercise 8 (page 8.24)

9

**Quiz 2 (30 minutes): Chapters 4, 8 ; setter: Chan TF**



### Bk. 1A Chapter 6 Statistics in Daily Life

#### Teaching Objective

- To let students know the various stages involved in statistics.
- To let students recognize the ways to collect data and organize data.
- To construct and interpret statistical diagrams including pictograms, bar charts, compound bar charts, broken-line graphs, pie charts and stem-and-leaf diagrams.
- To let students describe and predict the trends from broken-line graphs.
- To compare the presentations of the same set of data by using same type of graphs but with different scales.
- To use computer software to construct statistical diagrams.

#### Teaching Schedule

Date	Contents	Suggested Teaching Period	Exercise
1/12/2010 – 7/12/2010	6.1 Statistical Work 6.2 Collection and Organization of Data A. Collection of data B. Organization of data 6.3 Presentation and Analysis of Data A. Pictograms B. Bar charts C. Compound bar charts D. Broken-line graphs E. Pie charts F. Stem-and-leaf diagrams Chapter Summary	1 1 3 1	Exercise 6A (page 6.9) Exercise 6B (page 6.17) Exercise 6C (page 6.34) Check Yourself (page 6.40) Revision Exercise 6 (page 6.42)

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**Bk. 1B Chapter 10 Statistical Graphs**

**Teaching Objective**

- To let students know the existence of different types of data including discrete data and continuous data.
- To let students understand the criteria and ways of organizing data.
- To construct and interpret histograms and scatter diagrams.
- To let students identify the difference between histograms and bar charts.
- To compare the presentations of a given set of data by using various graphs.
- To let students choose suitable graphs to present a given set of data.
- To construct histograms and scatter diagrams using computer software.

**Teaching Schedule**

Date	Contents	Suggested Teaching Period	Exercise
8/12/2010 – 5/1/2011	10.1 Types of Data 10.2 Grouping of Data A. Frequency distribution B. Concepts about classes 10.3 Histograms 10.4 Scatter Diagrams A. Introduction to scatter diagrams B. Relation between data 10.5 Choosing Appropriate Statistical Graphs Chapter Summary	1 2 2 2 2 1	Exercise 10A (page 10.8) Exercise 10B (page 10.15) Exercise 10C (page 10.21) Check Yourself (page 10.28) Revision Exercise 10 (page 10.30)
		<u>10</u>	

**Exam 1 (60 minutes): Chapter 1, 2, 3, 4, 6, 8, 10; setter: Chan TF**



IMMANUEL LUTHERAN COLLEGE  
S.1 Mathematics Scheme of Work (2010-2011)  
**Bk. 1B Chapter 12 Ratio and Rate**

**Teaching Objective**

- To let students understand the meaning of rate and ratio.
- To let students know the notations of  $a : b$  and  $a : b : c$ .
- To apply rate and ratio to solve real-life problems including mensuration problems.

**Teaching Schedule**

Date	Contents	Suggested Teaching Period	Exercise
21/2/2011 – 4/3/2011	12.1 Ratio	2	Exercise 12A (page 12.10) Exercise 12B (page 12.18) Exercise 12C (page 12.24) Exercise 12D (page 12.30) Check Yourself (page 12.33) Revision Exercise 12 (page 12.33)
	12.2 Ratios of Three Like Quantities	3	
	12.3 Rate	3	
	12.4 Scale Plan	3	
	Chapter Summary	1	

12

**Quiz 3 (30 minutes): Chapters 7, 12 ; setter: Chan TF**

## Bk. 1B Chapter 13 Angles in Rectilinear Figures

### Teaching Objective

- To let students recognize different types of angles in rectilinear figures.
- To explore and use the properties of angles associated with parallel lines.
- To explore and use the properties of angles of triangles.
- To let students understand the weaknesses of intuitive approach and the strengths of deduction.
- To let students perform simple proofs using the geometric knowledge learned.

### Teaching Schedule

Date	Contents	Suggested Teaching Period	Exercise
7/3/2010 – 28/3/2010	13.1 Adjacent Angles, Angles at a Point and Vertically Opposite Angles A. Adjacent angles B. Angles at a point C. Vertically opposite angles 13.2 Corresponding Angles, Alternate Angles, Interior Angles on the Same Side A. Transversal and angles produced by it B. Angles associated with parallel lines	4          4	Exercise 13A (page 13.7)          Exercise 13B (page 13.15)

8

**UT 2 (45 minutes): Chapters 7,12, 13.1, 13.2 ; setter: Chan TF**

**Bk. 2A Chapter 1 Estimation and Approximation**

**Teaching Objective**

- To recognize the need to use estimation strategies in real-life situations.
- To determine when to estimate values or compute the exact values.
- To select and use estimation strategies to estimate values, and judge the reasonableness of the results.
- To choose appropriate means for calculations such as mental computation, paper and pencil, or calculators etc.
- To know the concepts and techniques of rounding off numbers to a required number of significant figures.

**Teaching Schedule**

Date	Contents	Suggested Teaching Period	Exercise
4/4/2011 – 11/4/2011	1.1 Estimation A. What is estimation? B. When should we use estimation? 1.2 Estimation Strategies A. Reformulation B. Compensation C. Translation D. Rounding up / Rounding down 1.3 Choosing Appropriate Means for Calculations 1.4 Significant Figures Chapter Summary	1  2          2  2  1	Exercise 1A (page 1.11) Exercise 1B (page 1.16)

8

**Bk. 1A Chapter 5 Percentage**

**Teaching Objective**

- To let students understand the meaning of percentages.
- To solve problems involving percentage increases and decreases.
- To let students know more applications of percentage such as profit, loss and discount.

**Teaching Schedule**

Date	Contents	Suggested Teaching Period	Exercise
14/4/2011 – 13/5/2011	5.1 Revision on Percentages A. Meaning of percentages B. Arithmetic operations with percentages  5.2 Simple Problems on Percentage A. Finding percentages B. Finding a part C. Finding the whole  5.3 Percentage Increase and Decrease A. Percentage increase B. Percentage decrease  5.4 Profit and Loss A. Profit B. Loss  5.5 Discount  Chapter Summary	2  3  3  2  2 2	Exercise 5A (page 5.6)  Exercise 5B (page 5.11)  Exercise 5C (page 5.18)  Exercise 5D (page 5.26)  Exercise 5E (page 5.32) Check Yourself (page 5.35) Revision Exercise 5 (page 5.36)

14

**Quiz 4 (30 minutes): Chapters 1, 5 ; setter: Young KM**

## Bk. 1B Chapter 9 Introduction to Coordinates

### Teaching Objective

- To let students understand and use rectangular coordinates and polar coordinates to describe the positions of points on a plane.
- To let students use ordered pairs of a rectangular coordinate system to locate points on a plane.
- To let students find the distance between two points on a horizontal or vertical line on a rectangular coordinate plane.
- To let students find the areas of polygons on a rectangular coordinate plane.
- To let students describe the effects of transformations on the points on a coordinate plane intuitively.

### Teaching Schedule

Date	Contents	Suggested Teaching Period	Exercise
16/5/2011 – 27/5/2011	9.1 Ordered Pairs 9.2 Rectangular Coordinate System A. Rectangular coordinate plane B. Drawing a rectangular coordinate plane on graph paper 9.3 Distances 9.4 Areas of Polygons 9.5 Polar Coordinate System 9.6 Transformations on a Rectangular Coordinate Plane A. Translation B. Reflection C. Rotation Chapter Summary	1 1 1 3 2 3	Exercise 9A (page 9.10)  Exercise 9B (page 9.16) Exercise 9C (page 9.23) Exercise 9D (page 9.29) Exercise 9E (page 9.35) Exercise 9F (page 9.42)  Check Yourself (page 9.45) Revision Exercise 9 (page 9.47)

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## Bk. 1B Chapter 13 Angles in Rectilinear Figures

### Teaching Objective

- To let students recognize different types of angles in rectilinear figures.
- To explore and use the properties of angles associated with parallel lines.
- To explore and use the properties of angles of triangles.
- To let students understand the weaknesses of intuitive approach and the strengths of deduction.
- To let students perform simple proofs using the geometric knowledge learned.

### Teaching Schedule

Date	Contents	Suggested Teaching Period	Exercise
30/5/2011 – 8/6/2011	<p>13.3 Angles of Triangles</p> <p>A. Sum of the interior angles of a triangle</p> <p>B. Exterior angles of triangles</p> <p>C. Base angles of isosceles triangles</p> <p>13.4 Simple Proofs in Geometry</p> <p>A. Are your observation and experience reliable?</p> <p>B. Deduction</p> <p>C. Proofs related to straight lines and angles</p> <p>D. Determination of parallel lines</p> <p>E. Proofs related to triangles</p> <p>Chapter Summary</p>	<p>3</p> <p>3</p> <p>2</p>	<p>Exercise 13C (page 13.24)</p> <p>Exercise 13D (page 13.39)</p> <p>Check Yourself (page 13.43) Revision Exercise 13 (page 13.46)</p>

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**Exam 2 (60 minutes): Chapter 5, 7, 9, 12, 13 ; Bk2A Ch 1; setter: Young KM**