

**GRADE TEN**

**IMMACULATE CONCEPTION HIGH SCHOOL**  
**MATHEMATICS DEPARTMENT**  
**GRADES 10 CURRICULUM**  
**2017- 2018**

**INTRODUCTION**

*“Each student is capable of learning mathematics and learning it well.”*  
*“Success is best achieved when school and families work together.”*

**GOAL**

To empower all I.C.H.S. students to keep abreast with the demands of the 21<sup>st</sup> century with regards to mathematical skills, attitudes and understanding that will enable them to be successful in career choices and their daily lives.

**FRAMEWORK**

The Mathematics Curriculum has been drafted in keeping with the NSC (STEM) and CXC (CSEC) programmes. It is organized by grade level to run over a period of five (5) years from grade 7 through to grade 11. Please note that the CXC (CSEC) Mathematics Examination which will be administered at the end of grade 11 is **NOT** examined only on grades 10 and 11 objectives. It is examined on the entire five (5) years of work.

The I.C.H.S. Mathematics Department believes that proficiency in most of mathematics is not an inborn characteristic; it is a consequence of persistence, effort, practice, support, encouragement and effective instruction. The use of the curriculum will allow all stakeholders: teachers, parents and students to effectively and efficiently execute the programme.

**TO PARENTS/GUARDIAN**

Ways to help your child succeed in mathematics:

- Always talk about mathematics in positive ways.
- Have high expectation for your child.
- Become familiar with what your child is studying in mathematics.
- Highlight forms of mathematics your child may encounter in her daily life.
- Help your child with her homework; if necessary identify a friend or relative who knows mathematics. Find out if that person would be willing to answer an occasional phone call from your daughter.
- Seek assistance if and when your child experiences difficulty in mathematics.
- Encourage your child.

**GRADE 10**  
**TERM I**

<b><u>TOPIC</u></b>	<b><u>OBJECTIVES</u></b>
<b><u>1. Algebraic Operation</u></b>	Students should be able to : <ol style="list-style-type: none"> <li>1. Add, subtract, divide and multiply like terms and Expressions.</li> <li>2. Expand <math>(a + b)^2</math> and <math>(a-b)^2</math></li> <li>3. Solve worded problems involving sum and differences of squares.</li> </ol>
<b><u>2. Construction (with ruler &amp; compasses only!)</u></b>	Students should be able to : <ol style="list-style-type: none"> <li>1. Construct angles <math>90^\circ</math> and <math>60^\circ</math></li> <li>2. Bisect angle; Then use this concept to construct other angles e.g. <math>15^\circ</math>, <math>30^\circ</math>, <math>45^\circ</math>, <math>75^\circ</math>, <math>105^\circ</math>, <math>135^\circ</math> etc.</li> <li>3. Construct perpendicular bisector to a line. Construct a perpendicular line to another line from :               <ul style="list-style-type: none"> <li>- Any point on the line segment</li> <li>- A point outside of the line segment</li> </ul> </li> <li>4. Construct circumcircle &amp; inscribe circle</li> <li>5. Construct parallel lines</li> <li>6. Construct quadrilaterals and triangles</li> </ol>
<b><u>3. Transformation Geometry II</u></b> <ol style="list-style-type: none"> <li>i) Rotation</li> <li>ii) Enlargement</li> </ol>	Students should be able to: <ol style="list-style-type: none"> <li>1.               <ol style="list-style-type: none"> <li>a) define rotation</li> <li>b) rotate a point/ figure about a given centre and in a given direction.</li> <li>c) list the properties of rotation</li> <li>d) find centre, angle and direction of rotation when figure and its image is given</li> </ol> </li> <li>i)               <ol style="list-style-type: none"> <li>a) define an enlargement</li> <li>b) produce an enlargement when given figure, centre of enlargement and scale factor.</li> <li>c) list the properties of enlargement.</li> <li>d) find centre of enlargement and scale factor when figure and its image is given</li> </ol> </li> <li>2. identify each transformation given figure and image.</li> </ol>
<b><u>4. Variation</u></b>	Students should be able to : <ol style="list-style-type: none"> <li>1. Represent direct and inverse variations symbolically.</li> <li>2. Perform calculations involving direct variation and inverse variation.</li> </ol>

<b><u>TOPIC</u></b>	<b><u>OBJECTIVES</u></b>
<b>5. <u>Factorization</u></b>	<p>Students should be able to :</p> <ol style="list-style-type: none"> <li>1. Factorize using the distributive law.</li> <li>2. Factorize difference of two squares e.g. <math>x^2 - y^2</math></li> <li>3. Factorize quadratic expressions.</li> <li>4. Add, subtract, multiply and divide like terms and expressions by factorizing.</li> </ol>

## **TERM II**

<b><u>TOPIC</u></b>	<b><u>OBJECTIVES</u></b>
<b>6. <u>Matrices</u></b>	<p>Students should be able to :</p> <p>Quick Review of objectives 1-6 [done in grade 9]</p> <ol style="list-style-type: none"> <li>1. Define a matrix</li> <li>2. Give the order of a matrix</li> <li>3. Use row and column to identify an entry/element in a given matrix</li> <li>4. Identify equal, identity , square and zero matrix</li> <li>5. Add and subtract matrix</li> <li>6. Multiply a matrix by a scalar number.</li> <li>7. Multiply two matrices.</li> <li>8. Recognize that matrix multiplication is not commutative.</li> <li>9. Use matrices to solve simple problem in geometry</li> <li>10. Calculate the determinant of a <math>2 \times 2</math> matrix.</li> <li>11. Identify <math>2 \times 2</math> singular matrix.</li> <li>12. Obtain the inverse of a non-singular <math>2 \times 2</math> matrix.</li> <li>13. Use matrices to solve simple problem in algebra.</li> </ol>
<b>8. <u>Areas and Volumes</u> Review (a) Area and circumference of circle (b) Area and Perimeter of plane shapes</b>	<p>Students should be able to :</p> <ol style="list-style-type: none"> <li>1. Identify prisms, pyramids and spheres</li> <li>2. Calculate the surface area of a simple right prism, a pyramid, and a sphere.</li> <li>3. Calculate the volume of a simple right prism, a pyramid and a sphere.</li> <li>4. Calculate the volume and surface area of composite solids.</li> </ol>
<b>7. <u>Similar Shapes</u></b>	<p>Students should be able to :</p> <ol style="list-style-type: none"> <li>1. List the properties of similar shapes.</li> <li>1. Distinguish between similarity and congruency</li> <li>2. Prove that given shapes are similar</li> </ol>

	<p>3. Solve triangles using the concept of similar shapes Calculate scale factor of similar shapes.</p>
<b>9. <u>Indices</u></b>	<p>Students should be able to :</p> <ol style="list-style-type: none"> <li>1. Use laws of indices to manipulate algebraic expressions involving integral and rational indices.</li> <li>2. Apply the laws of indices in the solution of equations</li> </ol>
<b>10. <u>Relations, Functions and Graphs</u></b>	<p>Students should be able to :</p> <ol style="list-style-type: none"> <li>1. Define a function as a many-to-one or one- to –one relation.</li> <li>2. Use functional notations e.g. <math>f : x \rightarrow x^2</math>, or <math>f(x) = x^2</math> as well as <math>y = f(x)</math> for a given domain.</li> <li>3. Draw and use graphs of the functions <math>\{(x, y) : y = a + bx\}</math>, <math>\{(x, y) : y = a + bx + cx^2\}</math> where <math>a, b</math> and <math>c</math> are integers.</li> <li>4. Read and interpret graphs of functions.</li> <li>5. Use graphs to determine the elements of the domain, which have a given image or vice versa.</li> <li>6. Use graphs to determine the interval of a domain for which the elements of the range may be positive or negative.</li> <li>7. Use graphs to determine the <b>roots</b> of the given function.</li> <li>8. Use graphs to determine the maximum or minimum values of the function over a given interval.</li> <li>9. Use graphs to find the solution set of a quadratic and linear equations.</li> </ol>

### **TERM III**

<b><u>TOPIC</u></b>	<b><u>OBJECTIVES</u></b>
<b>11. <u>Solving Quadratic Equations</u></b>	<p>Students should be able to :</p> <ol style="list-style-type: none"> <li>1. Solve simultaneous equations given one linear and one quadratic.</li> <li>2. Solve quadratic equations by method of : <ol style="list-style-type: none"> <li>(a) Factorization</li> <li>(b) The quadratic formula</li> <li>(c) Completing the square</li> </ol> </li> <li>3. Determine maximum or minimum values of quadratic functions by method of completing the square.</li> </ol>

<b>12. <u>Functions II (Inverse and Composite)</u></b>	Students should be able to : <ol style="list-style-type: none"><li data-bbox="609 262 1339 336">1. Recognize simple functions that have inverses and determine their inverses.</li><li data-bbox="609 336 1339 409">2. Interpret and make use of functional notations for example, <math>f(x)</math>, <math>g(x)</math>, <math>f^{-1}(x)</math> and their compositions.</li></ol>

**\* NB: Sets II & Simultaneous Equations should be done first. These topics were carried over from grade Nine (see grade nine syllabus).**