I. Course Summary

This is a complete high school algebra 2 course that meets and exceeds Minnesota Mathematics Standards. Successful completion of this course as well as prior courses should have students prepared for the MCA. The course incorporates the MYP fundamental concepts of holistic learning, intercultural awareness and communications, by making connections between mathematics and other subjects. The cultural aspects are shown in that mathematics is embedded in all cultures. Finally, students are expected to be able to show what they know in a variety of manners. The IB learner profile is used as a guide in developing and implementing the curriculum. Being a mathematics course, an emphasis is placed on developing inquirers and thinkers while trying to have students reflect upon what they have learned.

II. Units of Study/State Standards/MYP Aims and Objectives

Units of study:

Semester 1:
- Foundations for Functions
- Linear Functions
- Linear Systems
- Quadratic Functions

Semester 2:
- Polynomials
- Exponential Functions
- Data and Probability
- Trigonometry
- Sequences and Series

A complete district syllabus with the State Standards that will be addressed can be found at: http://curriculum2.spps.org

The aims of teaching and learning mathematics includes encouraging students to:
1) Appreciate the usefulness and power of mathematics
2) Enjoy math and develop perseverance
3) Be able to communicate using mathematical notation
4) Develop knowledge, and thinking skills
5) Recognize the presence of mathematics in their lives

Over the course of the year students will achieve the objectives of:
1) Acquiring knowledge and understanding
2) Be able to recognize and investigate patterns
3) Communicate effectively using mathematical language and notation
4) Reflect upon their work and conclusions.
III. Standards and IB MYP Aims

Standard 9.2.1: Understand the concept of function, and identify important features of functions and other relations using symbolic and graphical methods where appropriate.
9.2.1.7: Understand the concept of an asymptote and identify asymptotes for exponential functions and reciprocals of linear functions, using symbolic and graphical methods.

Standard 9.2.2: Recognize linear, quadratic, exponential and other common functions in real-world and mathematical situations; represent these functions with tables, verbal descriptions, symbols and graphs; solve problems involving these functions, and explain results in the original context.
9.2.2.4: Express the terms in a geometric sequence recursively and by giving an explicit (closed form) formula, and express the partial sums of a geometric series recursively.
9.2.2.6: Sketch the graphs of common non-linear functions such as \( f(x) = x^3 \), and translations of these functions, such as \( f(x) = (x-2)^3 + 1 \). Know how to use graphing technology to graph these functions.

Standard 9.2.3: Generate equivalent algebraic expressions involving polynomials and radicals; use algebraic properties to evaluate expressions.
9.2.3.1: Evaluate polynomial and rational expressions and expressions containing radicals and absolute values at points in their domains.
9.2.3.4: Add, subtract, multiply, divide and simplify algebraic fractions.

Standard 9.2.4: Represent real-world and mathematical situations using equations and inequalities involving linear, quadratic, exponential and \( n \)th root functions. Solve equations and inequalities symbolically and graphically. Interpret solutions in the original context.
9.2.4.1: Represent relationships in various contexts using quadratic equations and inequalities. Solve quadratic equations and inequalities by appropriate methods including factoring, completing the square, graphing and the quadratic formula. Find non-real complex roots when they exist. Recognize that a particular solution may not be applicable in the original context. Know how to use calculators, graphing utilities or other technology to solve quadratic equations and inequalities.
9.2.4.5: Solve linear programming problems in two variables using graphical methods.
9.2.4.6: Represent relationships in various contexts using absolute value inequalities in two variables; solve them graphically.
9.2.4.7: Solve equations that contain radical expressions. Recognize that extraneous solutions may arise when using symbolic methods.

Standard 9.4.1: Display and analyze data; use various measures associated with data to draw conclusions, identify trends and describe relationships.
9.4.1.1: Describe a data set using data displays, such as box-and-whisker plots; describe and compare data sets using summary statistics, including measures of center, location and spread. Measures of center and location include mean, median, quartile and percentile. Measures of spread include standard deviation, range and inter-quartile range. Know how to use calculators, spreadsheets or other technology to display data and calculate summary statistics.
9.4.1.3: Use scatter plots to analyze patterns and describe relationships between two variables. Using technology, determine regression lines (line of best fit) and correlation coefficients; use regression lines to make predictions and correlation coefficients to assess the reliability of those predictions.

Standard 9.4.3: Calculate probabilities and apply probability concepts to real-world and mathematical problems.
9.4.3.2: Calculate experimental probabilities by performing simulations or experiments involving a probability model and using relative frequencies of outcomes.
9.4.3.7: Understand and use simple probability formulas involving intersections, unions and complements of events.
9.4.3.9: Use the relationship between conditional probabilities and relative frequencies in contingency tables.

**MYP Aims**
- enjoy mathematics, develop curiosity and begin to appreciate its elegance and power develop an understanding of the principles and nature of mathematics
- communicate clearly and confidently in a variety of contexts
- develop logical, critical and creative thinking
- develop confidence, perseverance, and independence in mathematical thinking and problem-solving
- develop powers of generalization and abstraction
- apply and transfer skills to a wide range of real life situations, other areas of knowledge and future developments
- appreciate how developments in technology and mathematics have influenced each other
- appreciate the moral, social and ethical implications arising from the work of mathematicians and the applications of mathematics
- appreciate the international dimension in mathematics through an awareness of the universality of mathematics and its multicultural and historical perspectives appreciate the contribution of mathematics to other areas of knowledge
- develop the knowledge, skills and attitudes necessary to pursue further studies in mathematics
- develop the ability to reflect critically upon their own work and the work of others.

**IV. Text**

The text for this class is **Holt – Algebra 2**. Additional materials that are required are a pen, pencil, and folder/notebook. These materials will be brought to class daily. A four-function calculator (addition, subtraction, multiplication, and division) is recommended for completion of homework. Graphing calculators, although useful are not required. The textbook is also available in an on-line and CD-ROM version upon request.

**Technology and Internet:**

- Calculators (Graphing or scientific) may be used to solve problems involving cumbersome computation and to get at advanced concepts.
- One-Stop-Planner with Test and Practice Generator and State-Specific Resources CD-ROM.
- Lesson Tutorial Videos CD-ROM
- Internet access may be used for research and use of web based math programs. Here are a few sites to help get started:
  - [http://go.hrw.com](http://go.hrw.com)
  - [http://mathforum.org/dr.math/](http://mathforum.org/dr.math/)
  - [http://illuminations.nctm.org/](http://illuminations.nctm.org/)
  - [http://education.ti.com](http://education.ti.com)
  - [http://geogebra.com](http://geogebra.com)
  - [http://www.tenmarks.com](http://www.tenmarks.com)
  - [http://www.desmos.com](http://www.desmos.com)
  - [http://education.ti.com](http://education.ti.com)... etc., to mention a few

- All students will have access to Holt’s online textbook and Student One Stop CD-ROM
V. Methods of Assessment

Teachers will regularly use a variety of IB MYP both formative and summative assessments to gauge and guide student success. Formative assessments will be routine, informative and on-going. Among other strategies teachers may choose to use exit cards, warm up problems, visual checks for understanding (thumbs up, note cards, etc.), quick writes, or discussion. Quizzes within a unit might also be used to evaluate student progress and adjust instruction. Summative assessments will commonly take the form of chapter tests, unit tests, and/or group or individual projects. Cumulative final exams may also be given.

Formative assessments take place frequently, as they serve as a tool to inform and improve the teaching process and prepare students for summative assessment. Examples are math review, quick write, daily homework, homework quiz, and think-group-share. These represent 30% of the overall grade for the marking period.

Summative assessments typically take place at the end of a unit. Students must demonstrate their knowledge, understanding of concepts, and/or skills while answering the unit-guiding question based on local, state and national standards and MYP Areas of Interaction. Examples of summative assessments are tests and portfolio problems. These represent 70% of the overall grade for the marking period.

Students are evaluated in four different areas with IB MYP rubrics for this class:

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Area</th>
<th>Description</th>
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<tbody>
<tr>
<td>A</td>
<td>Knowledge and Understanding</td>
<td>Students will demonstrate knowledge of concepts.</td>
</tr>
<tr>
<td>B</td>
<td>Investigating Patterns</td>
<td>Students will work through investigations to develop critical thinking.</td>
</tr>
<tr>
<td>C</td>
<td>Communicating</td>
<td>Students will use appropriate mathematical language and different forms of representation to communicate mathematical ideas.</td>
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<tr>
<td>D</td>
<td>Applying mathematics in real-life contexts</td>
<td>Student can select appropriate mathematical strategies to solve real-world problems.</td>
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IB MYP rubrics use an 8-point scale, with 8 representing “excellent achievement” and 1-point representing “limited achievement.” When these assessments will be counted toward students’ grades in the class, they will be converted to a standard A, B, C, D, N scale and the point value will appear on the rubric. Parents and guardians, please ask your student to share their rubrics with you.

Please also see Highland Park Grading and Assessment Policy on the Highland Park Senior High Webpage for additional information about assessment.

VI. Methodology

In MYP, teachers use a variety of teaching methods to promote thinking and communication. Critical thinking requires students to draw justifiable conclusions and generalizations from investigating patterns. Communication and reflection helps deepen understanding.

Unless indicated or pressing issues or school events come up,

- Every Monday, Tuesday, and Thursday classes will begin with “Math Review” and transit to daily lessons.
- Every “other” Wednesdays we shall have “Problem Solving” according to the protocols of “Five Easy Steps”. (Working in groups of three or four students and presenting or posting posters for “gallery walks”)
- Every Friday we shall have quizzes/tests by alternating between “Math Review problems” quizzes, regular section assessments, or unit assessments.
VII. Other course information
Expectations:

Students will access the textbook either using a hard copy book or online at:

http://my.hrw.com
User Name: bparent19
Password: u7z4

In addition the website http://go.hrw.com is a site that links students to a vast collection of educational online materials directly related to chapter content.
Additional required materials are pen/pencil and folder/notebook and ipad with district selected apps. These materials are to be brought to class daily. Graphing and Scientific calculators are highly recommended.

Homework will be given daily, with time to begin most assignments in class. However, most students will find that they will not be able to complete all of the assignments, so homework is to be expected. Homework will be checked for completion and correctness in various manners. All due dates will be announced.

New this year
Formative assessments that are late will be accepted for up to 3 days past the due date with a reduction in score. Late assessments will be reduced by 10% for one day late, 20% for two days late, and 30% for three days late. After that it is permanently “M” missing work. This is not to extend past the end of the quarter.

Late work is NOT accepted on the last week of the quarter.

Students will be expected to adhere to the following classroom principles:

1. Respectful – I will demonstrate respect for myself, others, school, and the community
2. Responsible – I will be a responsible member of my school community
3. Safe – I will help create a school environment where every student feels safe
4. Engage- Follow school wide policy of NO CELLPHONE use during class.

Please see individual teacher when extra assistance is needed.

All school district policies dealing with absences, tardiness, late work and other issues will be followed. Students are expected to be respectful of staff, other students, property, and of themselves.