



## Principles of Mathematics, Grade 10, Academic (MPM2D)

**Credit value:** 1.0 Credits  
**Prerequisite:** Principles of Mathematics, Grade 9, Academic or Foundations of Mathematics, Grade 9, Applied

**Teacher:** Steve Kinnear  
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**Textbook:** Principles of Mathematics 10. Canton et. al. McGraw-Hill Ryerson, 2007.

### Course Description:

This course enables students to broaden their understanding of relationships and extend their problem-solving and algebraic skills through investigation, the effective use of technology, and abstract reasoning. Students will explore quadratic relations and their applications; solve and apply linear systems; verify properties of geometric figures using analytic geometry; and investigate the trigonometry of right and acute triangles. Students will reason mathematically and communicate their thinking as they solve multi-step problems.

**Evaluation:** Your Final Mark will include:

70%	Course Work (assignments, quizzes, tests)
10%	Summative Assessment
20%	Final Exam

Your Course Work will reflect four categories:

Knowledge/Understanding	30%
Application	30%
Communication	20%
Thinking/Investigation	20%

Your Learning Skills will be evaluated as NI, S, G, or E:

Works Independently
Work Habits / Homework
Organization
Initiative
Teamwork

**Academic due dates:** All homework, assignments, and projects are expected to be submitted on the “due date.”

If a student does not submit his/her work on the due date the teacher will contact the parent/guardian to notify them of the outstanding work that day. The teacher will not provide support to the student after the due date.

The “window of opportunity” date is the final date on which the student may hand in the task. This is also the date on which the work submitted on the due date will be returned to students. For more information, see the *Student Handbook and Course Calendar*.

**Required Materials:** Binder, Textbook, Writing Utensils, Ruler, Calculator

**Extra Help:** Extra help is available Monday to Friday 9:00–9:55 AM and after school by appointment.

### Overall Expectations:

#### Quadratic Relations of the Form $y = ax^2 + bx + c$

- determine the basic properties of quadratic relations;
- relate transformations of the graph of  $y = x^2$  to the algebraic representation  $y = a(x - h)^2 + k$ ;
- solve quadratic equations and interpret the solutions with respect to the corresponding relations;
- solve problems involving quadratic relations.

## Analytic Geometry

- model and solve problems involving the intersection of two straight lines;
- solve problems using analytic geometry involving properties of lines and line segments;
- verify geometric properties of triangles and quadrilaterals, using analytic geometry.

## Trigonometry

- investigate similar triangles and solve problems related to similarity;
- solve problems involving right triangles, using the primary trigonometric ratios and Pythagorean theorem;
- solve problems involving acute triangles, using the sine law and the cosine law.

Unit	Time
<b>Linear Systems</b> This unit will focus on the use of two linear equations to model a problem. Points of intersection will be found through numerical, graphical, and algebraic analysis. Students will explore the nature of systems that have zero, one, or infinite solutions.	17 h
<b>Analytic Geometry</b> This unit provides contexts for applying formulas for midpoint, distance between points, and circles centred at the origin. Properties of triangles and quadrilaterals are investigated analytically. Students will also solve multi-step problems involving the solutions to linear systems.	20 h
<b>Quadratic Functions</b> This unit enables students to broaden their understanding of relations, extend their skills in multi-step problem solving, and continue to develop their abilities in abstract reasoning. Students will gather, organize, manipulate, and analyze data from primary and secondary sources to model and communicate results about quadratic situations. A variety of problems will be studied to ensure that students will gain depth of understanding of quadratics through meeting the same specific expectations in different contexts. Students will conduct investigations to verify or refute their own conjectures about relationships, using lines or curves of best fit, tables, and pattern descriptions. They will communicate their findings and describe trends.	48 h
<b>Trigonometry</b> Students are introduced to applications of similar triangles and trigonometry through a variety of activities that use concrete materials and allow students to move about inside and outside the classroom. They will investigate how the tangent ratio for the angle of inclination is connected to the slope of a line. The primary trigonometric ratios and the Sine and Cosine Laws are used to solve problems that are modelled by right-angled or acute triangles.	18 h
<b>Course Culminating Task</b> Students will work collaboratively and individually to solve challenging problems that involve all aspects of the course curriculum, in preparation for their Final Exam.	7 h
<b>Total</b>	110 h