

Mathematics 20-2

Course Outline

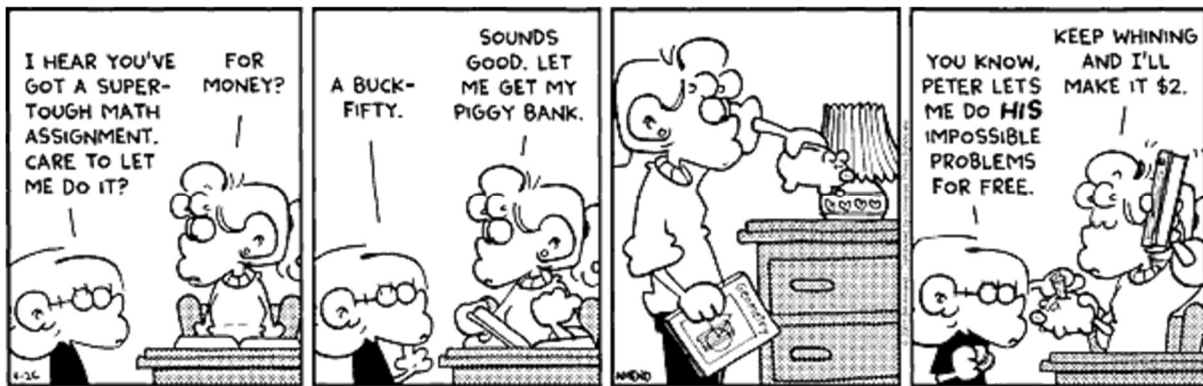
Fall 2021

Ken Hovey

Classroom Hours: I am available at any time for lunch hour and after school tutoring sessions. Please see me for an appointment

Email- hoveyk@prsd.ab.ca

Cell Phone: 780 834 7886

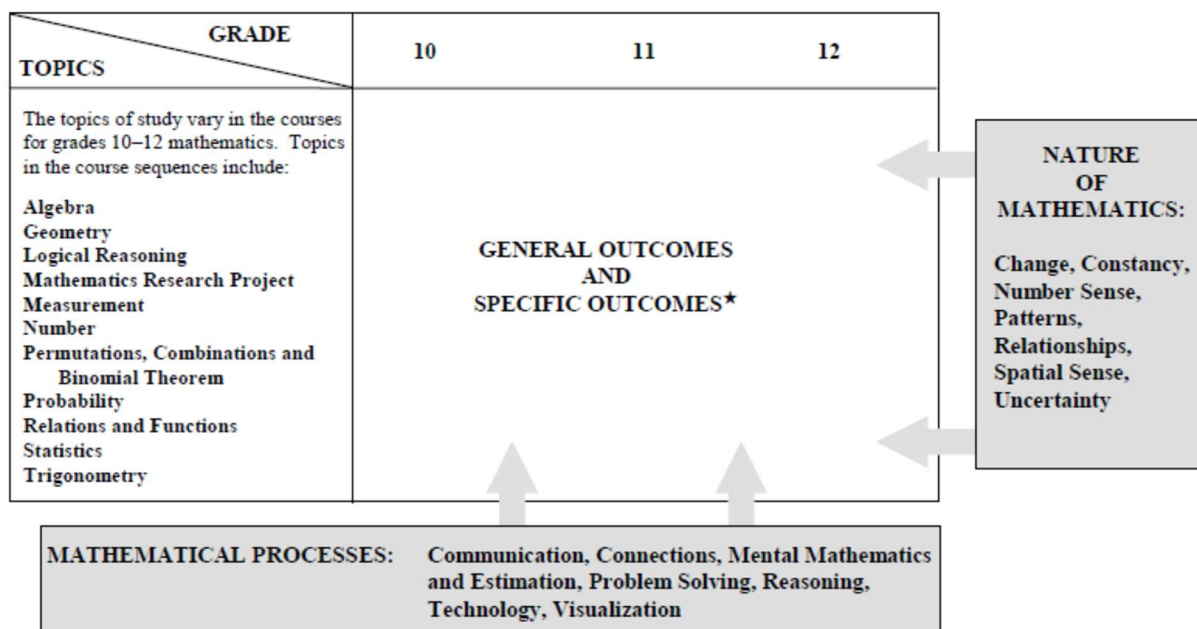


Course Intent

The Principles of Mathematics course sequence is designed to provide students with the mathematical understandings and critical-thinking skills identified for **post-secondary studies in programs that do not require the study of calculus**. Topics include geometry, measurement, number and logic, logical reasoning, relations and functions, statistics, and probability. One of the focuses of this course is to develop math problem solving skills in the student so you will be asked develop your own processes which work best for you.

CONCEPTUAL FRAMEWORK FOR GRADES 10–12 MATHEMATICS

The chart below provides an overview of how mathematical processes and the nature of mathematics influence learning outcomes.



Mathematical Processes

The seven mathematical processes are critical aspects of learning, doing and understanding mathematics. Students must encounter these processes regularly in a mathematics program in order to achieve the goals of mathematics education. This program of studies incorporates the following interrelated mathematical processes. They are to permeate the teaching and learning of mathematics.

Students are expected to:

<i>Communication</i> [C]	use <i>communication</i> in order to learn and express their understanding
<i>Connections</i> [CN]	make connections among mathematical ideas, other concepts in mathematics, everyday experiences and other disciplines
<i>Mental Mathematics</i>	demonstrate fluency with <i>mental mathematics</i> and
<i>Estimation</i> [ME]	<i>estimation</i>
<i>Problem Solving</i> [PS]	develop and apply new mathematical knowledge through <i>problem solving</i>
<i>Reasoning</i> [R]	develop mathematical <i>reasoning</i>
<i>Technology</i> [T]	select and use <i>technology</i> as a tool for learning and for solving problems
<i>Visualization</i> [V]	develop <i>visualization</i> skills to assist in processing information, making connections and solving problems.

Topic	Unit	Percent of Course
Number Sense and Logical Reasoning	Inductive and Deductive Reasoning	12%
	Radicals	15%
Statistics	Statistical Reasoning	12%
Measurement	Proportional Reasoning	11%
Geometry	Properties of Angles and Triangles	18%
	Acute Triangle Trigonometry	
Relations and Functions	Quadratic Functions	22%
	Quadratic Equations	
Mathematics Research Project		10%

Marks Distribution

Unit marks- Marks within each unit will be calculated according to the following schedule.

Assignments, Quizzes and Homework Checks	40%
Unit Exams	60%

Final Marks

Unit Marks and Project Mark	70%
Final Exam	30%

Most of this course will be evaluated with using quizzes and unit exams.

We will doing a great deal of work as a group after the lesson is presented. However, there will be several homework questions assigned each day to be completed for the next day.

The quizzes with in the units will be written response, where you will have to show your work for full marks.

The unit exams will be 70% multiple choice and 30% written response. I feel that the communication aspect of mathematics cannot be assessed effectively with a multiple choice exam only. The written response questions will be modelled after the written questions from the grade 12 diploma.

Course Objectives

Measurement

GENERAL OUTCOME

Develop spatial sense and proportional reasoning.

SPECIFIC OUTCOMES

It is expected that students will:

1. Solve problems that involve the application of rates.
2. Solve problems that involve scale diagrams, using proportional reasoning.
3. Demonstrate an understanding of the relationships among scale factors, areas, surface areas and volumes of similar 2-D shapes and 3-D objects.

Geometry

GENERAL OUTCOME

Develop spatial sense.

SPECIFIC OUTCOMES

It is expected that students will:

1. Derive proofs that involve the properties of angles and triangles.
2. Solve problems that involve properties of angles and triangles.
3. Solve problems that involve the cosine law and the sine law, excluding the ambiguous case.

Statistics

GENERAL OUTCOME

Develop statistical reasoning.

SPECIFIC OUTCOMES

It is expected that students will:

1. Demonstrate an understanding of normal distribution, including:
 - a. standard deviation
 - b. z-scores.
2. Interpret statistical data, using:
 - a. confidence intervals
 - b. confidence levels
 - c. margin of error.

Number Sense and Logic

GENERAL OUTCOME

Develop number sense and logical reasoning.

SPECIFIC OUTCOMES

It is expected that students will:

1. Analyze and prove conjectures, using inductive and deductive reasoning, to solve problems.
2. Analyze puzzles and games that involve spatial reasoning, using problem-solving strategies.
3. Solve problems that involve operations on radicals and radical expressions with numerical and variable radicands (limited to square roots).
4. Solve problems that involve radical equations (limited to square roots or cube roots).

Relations and Functions

GENERAL OUTCOME

Develop algebraic and graphical reasoning through the study of relations.

SPECIFIC OUTCOMES

It is expected that students will:

1. Demonstrate an understanding of the characteristics of quadratic functions, including:
 - vertex
 - intercepts
 - domain and range
 - axis of symmetry.
2. Solve problems that involve quadratic equations.

Mathematics Research Project

GENERAL OUTCOME

Develop an appreciation of the role of mathematics in society.

SPECIFIC OUTCOMES

It is expected that students will:

1. Research and give a presentation on a historical event or an area of interest that involves mathematics.