

Mathematics

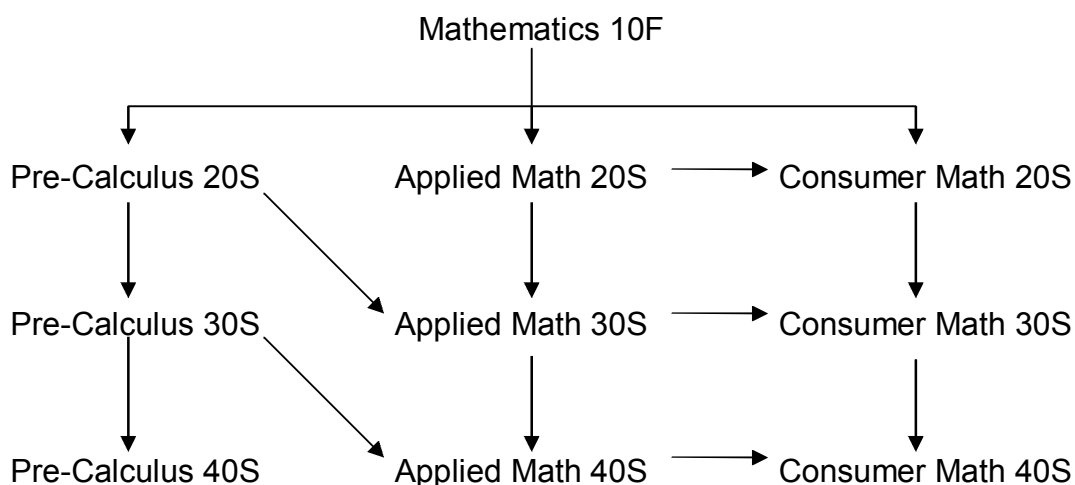
Did you know: (using the University of Manitoba as an example)



- That Pre-Calc 40S is required for several different degree programs of study; ie. Agriculture, Business, Environmental Science, Geology, Geophysics & Geography (B. Sc), Human Ecology, Engineering, Agricultural Science, Science: recommended for Physical Education
- That Pre-Calc 40S is required for professional studies in: Management and Pharmacy, recommended for Medicine & Dentistry
- That 40S Applied &/or Consumer Math is acceptable for entrance to University 1 with 2 credits of English at the 40 level

Did you know: (using Red River College as an example)

- That Pre-Calculus Mathematics 40S is required for entrance to the following programs. ie Chemical & Bioscience Technology and Applied Chemistry



Note: Pre-Calc 20S/30S → Applied 30S/40S is not recommended. Applied Math uses graphic calculator as established in 20S. The change from Pre-Calc to Applied Math might require considerable remedial work.

Mathematics 10F

1 credit
Compulsory

This course offers a review of arithmetic and mathematics topics covered in lower grades, plus an introduction to high school algebra and geometry. All students are required to write the Provincial Math Standards Test.

Topics covered in this course include:

- statistics
- polynomials
- spatial geometry
- linear equations

- similarity & congruency
- trigonometry
- logic
- probability
- exponents

Options:

Transformational geometry,
measurement

Transitional Mathematics 10F

1 credit

Grade 9 Transitional Mathematics is a curriculum that has been designed by a team of Manitoba classroom teachers and divisional/district mathematics consultants. It is intended to support at-risk students entering Grade 9 Mathematics. The curriculum focuses on the development of positive student attitudes toward learning, mathematical background, communication, motivation and work habits.

The aim of Transitional Mathematics is to develop mathematical power for all students. Mathematical power can be thought of as a student's ability to demonstrate mathematical understanding, mathematical thinking, and mathematical communication. In addition, students are expected to demonstrate effective learning behaviours, including responsibility for learning, effort and perseverance, respect for self and others, as well as consistent attendance and punctuality.

Pre-Calculus Mathematics 20S

1 credit

Prerequisite: Math 10F

This course is designed for students who intend to study calculus and related mathematics as part of their post-secondary education. The course comprises, primarily, a high-level study of theoretical mathematics with an emphasis on problem solving, mental mathematics, as well as cumulative exercises and testing. Students are required to learn mathematics concepts through practice and regular homework. Many of the exercises and problems are expected to be original or different from those presented in class.

Topics covered in this course include:

- polynomials and factoring
- analytic geometry
- trigonometry
- exponents and radical
- geometry

- rational expressions & equations
- functions
- statistics and probability
- variation & sequence

Applied Mathematics 20S

1 credit

Prerequisite: Math 10F

This course is one of two curricula available for students planning to pursue post-secondary studies in mathematics and science. This course is particularly directed to students planning to enter science, engineering, or the high-tech world of work. The other is Pre-Calculus Mathematics 20S. Applied Math is data-driven. Students collect data in experiments and activities, and develop mathematical concepts from analysis of that data. Students are expected to work both individually and in small groups and to demonstrate responsibility, flexibility and independence in their learning.

Topics covered in this course include:

- use of spreadsheets
- technical communications
- exploring math using technology
- linear models & patterns
- 2D/3D projects
- relations and functions
- coordinate geometry
- measurement technology
- trigonometry
- data management

Consumer Mathematics 20S

1 credit

Prerequisite: Math 10F

This course is intended for students whose post-secondary planning does not include a focus on mathematics and science-related fields. Consumer Math is a core credit course emphasizing consumer applications, problem solving, decision making as well as number sense and number use.

Topics include:

Consumer Math 20S –

- recreational Math
- problem Analysis
- spreadsheets
- personal finance-part A
- spatial geometry
- probability
- recreational Math
- problem analysis
- personal finance – part B & C
- geometry
- trigonometry
- probability and sampling

Pre-Calculus Mathematics 30S

1 credit

Prerequisite: Pre-Calculus Math 20S

This course is for students who wish to graduate from high school with standing in Pre-Calculus Math 40S as a possible requirement for post-secondary studies.

Topics covered in this course are:

- quadratic functions
- trigonometry
- algebra
- analytic geometry
- consumer mathematics
- logic/proof
- functions

Applied Mathematics 30S

1 credit

Prerequisite: Applied Math 20S

This course is one of two curricula available for students planning to pursue post-secondary studies in mathematics and science. The approach used in Applied Mathematics is primarily data driven, using numerical and geometrical problem solving techniques.

Applied Mathematics tasks are designed to develop student flexibility and responsibility. Technology is an integral part of this course. The graphing calculator is the primary technological tool used by students for mathematical exploration, modeling and problem solving.

Topics covered in this course may include:

- personal finance
- technical communication
- budget, time purchase and investment
- geometry of the circle
- calculus concepts
- data management & analysis
- graphing & systems of linear equations
- precision measurement
- linear programming
- non-linear functions

Consumer Mathematics 30S

1 credit

Prerequisite: any 20S Math

This course is the natural progression from Consumer Math 20S. This course is intended for students whose post-secondary planning does not include a focus on mathematics and science related fields.

Topics covered in this course are:

- problem analysis
- analysis of games & numbers
- relations & formulas
- income and debt
- data analysis and interpretation
- measurement technology
- owning & operating a vehicle
- personal income tax
- applications of probability

Pre-Calculus Mathematics 40S

1 credit

Prerequisite: Math 30S Pre-Calc

Grade 12 Pre-Calculus Math is designed for students who intend to study calculus and related mathematics as part of post-secondary education. The course comprises, primarily, a high-level study of theoretical mathematics with an emphasis on problem solving and mental mathematics, supported by cumulative exercises and testing. Students are required to learn mathematical concepts through practice and regular

homework. Many of the questions and problems on exercises, tests and examinations can be expected to be different from those presented in class.

Topics in 40S Pre-Calculus include:

- circular functions
- transformations
- exponents & logarithms
- permutations, combinations, binomial theorem
- probability
- conics
- statistics
- geometric sequences

Applied Mathematics 40S

1 credit

Prerequisite: Applied Math 30S

Grade 12 Applied Mathematics is one of two curricula available for students planning to pursue post-secondary studies in mathematics and science. The other is Grade 12 Pre-Calculus Mathematics. All other Applied Mathematics courses are heavily data driven, and promote the learning of numerical and geometrical problem solving techniques. Students collect data in experiments and activities and develop mathematics concepts by analyzing that data. Applied Mathematics is designed to promote student flexibility and responsibility. Students will work both individually and in cooperative groups with non-routine problems and projects. Responsibility is encouraged as students explore connections with other mathematical areas, other school subjects, and real-life applications.

Technology is an integral part of applied Mathematics. Students, for mathematical explorations, modeling, and problem solving use graphing calculators and/or computers. Technology is an integral part of both teaching and assessment in Applied Mathematics.

Topics include:

- probability
- variability & statistical analysis
- matrix modeling

- vectors
- applications of periodic functions
- sequences
- personal finance
- design and measurement

Consumer Mathematics 40S

1 credit

Prerequisite: any 30S Math

Grade 12 Consumer Mathematics is intended for students whose post secondary planning does not include a focus on mathematics and science-related fields. Grade 12 Consumer Mathematics is a core credit course emphasizing consumer applications, problem-solving, decision making, as well as number understanding and use. Students are expected to work both individually and in small groups on mathematical concepts and skills encountered and used in a technological society.

Some examples of assessment strategies within this course include projects, summative unit essays, experiments, journals, homework and portfolios.

Topics include:

Consumer Mathematics 40S

- problem analysis
- analysis of games & numbers
- personal finance
- government finances
- relations and formulas
- statistics
- investments
- taxation
- design and measurement
- career/life project