



MATH PRE-CALCULUS 12 COURSE OUTLINE

Teaching Staff 2018 – 2019:

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Prerequisite: Successful completion of Mathematics PreCalculus11.

Textbook: Precalculus 12 (McGraw-Hill Ryerson)

Course Overview: Pre-calculus 12 is an advanced high school mathematics course. Students who select Pre-calculus 12 should have a solid understanding of the Mathematics PreCalculus11 curriculum. This course is designed to provide students with the mathematical understandings and critical-thinking skills identified for post-secondary studies in programs that require the study of theoretical calculus. Course content includes the study of radical functions, polynomial functions, trigonometric functions, exponential and logarithmic functions, rational functions, transformations of these functions, operations with these functions, permutations and combinations.

Course Outline: PreCalculus 12 is comprised of three General Curriculum Outcomes; Trigonometry (T), Relations and Functions (RF), and Permutations, Combinations and Binomial Theorem (PCB)

Transformations and Radical Functions

Assessment: 20%

- RF02** Students will be expected to demonstrate an understanding of the effects of horizontal and vertical translations on the graphs of functions and their related equations.
- RF03** Students will be expected to demonstrate an understanding of the effects of horizontal and vertical stretches on the graphs of functions and their related equations.
- RF04** Students will be expected to apply translations and stretches to the graphs and equations of functions.
- RF05** Students will be expected to demonstrate an understanding of the effects of reflections on the graphs of functions and their related equations, including reflections through the x-axis, y-axis and the line $y = x$.
- RF06** Students will be expected to demonstrate an understanding of inverses of relations
- RF13** Students will be expected to graph and analyze radical functions (limited to functions involving one radical).

Polynomial Functions

Assessment: 10%

- RF11** Students will be expected to demonstrate an understanding of factoring polynomials of degree greater than 2 (limited to polynomials of degree ≤ 5 with integral coefficients).
- RF12** Students will be expected to graph and analyze polynomial functions (limited to polynomial functions of degree ≤ 5).

Trigonometry

Assessment: 30%

- T01** Students will be expected to demonstrate an understanding of angles in standard position, expressed in degrees and radians.
- T02** Students will be expected to develop and apply the equation of the unit circle.
- T03** Students will be expected to solve problems, using the six trigonometric ratios for angles expressed in radians and degrees.
- T04** Students will be expected to graph and analyze the trigonometric functions sine, cosine and tangent to solve problems.
- T05** Students will be expected to solve algebraically and graphically, first and second degree trigonometric equations with the domain expressed in degrees and radians.
- T06** Students will be expected to prove trigonometric identities using: Reciprocal identities, Quotient identities, Pythagorean identities, Sum or difference identities, Double angle identities

Exponential and Logarithmic Functions

Assessment: 15%

- RF07** Students will be expected to demonstrate an understanding of logarithms
- RF08** Students will be expected to demonstrate an understanding of the product, quotient and power laws of logarithms.
- RF09** Students will be expected to graph and analyze exponential and logarithmic functions
- RF10** Students will be expected to solve problems that involve exponential and logarithmic equations.

Rational Functions and Function Operations

Assessment: 15%

- RF01** Students will be expected to demonstrate an understanding of operations on, and compositions of, functions
- RF14** Students will be expected to graph and analyze rational functions (limited to numerators and denominators that are monomials, binomials, or trinomials)

Permutations, Combinations & Binomial Theorem

Assessment: 10%

- PCB01** Students will be expected to apply the fundamental counting principle to solve problems.
- PCB02** Students will be expected to determine the number of permutations on n elements take r at a time to solve problems.
- PCB03** Students will be expected to determine the number of combinations on n different elements taken r at a time to solve problems.
- PCB04** Students will be expected to expand powers of a binomial in a variety of ways, including the binomial theorem (restricted to exponents that are natural numbers).

Assessment:

Assessment is the process of gathering, from a variety of sources, information that accurately reflects how well a student is achieving the learning outcomes in a subject or course.

- A) **Formative assessment** is to show growth over time, determine student needs, plan next steps in instruction, and provide students with descriptive feedback.
- B) **Summative assessment** is to determine the extent to which learning has occurred for students.

Evaluation is the process of analyzing, reflecting upon, and summarizing assessment information and making judgements and / or decisions based on the information gathered.

Unit assessments will consist of multiple opportunities for a student to demonstrate their understanding of the outcomes. Such opportunities include (but are not limited to) tests, quizzes, in-class assignments, portfolios, comprehension questions, and projects. Teachers will employ both formative and summative assessments in gathering information to determine a student grade. No one method of assessment will be worth more than 50% of the unit. Throughout the semester, students may feel that they have not successfully demonstrated their understanding of particular outcomes and would like another opportunity to demonstrate that they now "Get It". Please refer to the Multiple Opportunities document on teacher/school website for more details.

Mathematics courses require commitment and students must take responsibility for achieving the outcomes. Students need to make sure that they keep up with the work and seek help early if they encounter difficulties before they become insurmountable.

Students are NOT permitted to exempt the final exam.

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| Final Assessment: | 75% Course Outline |
| | 25% Final Exam |

Communication of Student Achievement:

A collaborative effort of all stakeholders (student / parent/ teacher) is important to ensure student academic success. In an effort to maintain communications, a number of avenues are available.

- Class Web sites are updated daily
- Marks and attendance can be checked at any time on the Parent/ Student Portal of Powerschool. (If you do not have a password for the portal, please contact the main office)
- The Auto-dialer calls home regarding unexcused absences and upcoming events.
- Parents and students are encouraged to contact the teacher via email if they have any concerns regarding academic progress.
- Important dates include:
 - Curriculum night: September 12, 2018
 - Parent/teacher interviews: November 21, 2018
 - Multiple Opportunity Testing week: TBD