

Mathematics 10 Pre-IB

Mathematics Pre-IB 10 will be two semesters long, a minimum of 220 instructional hours, and will address both the Mathematics 10 curriculum outcomes and the additional curriculum outcomes listed below.

All students enrolled in Mathematics Pre-IB 10 will write the Nova Scotia Mathematics 10 examination in June 2014.

Students will be expected to

1. demonstrate an understanding of number sets, interval notation, and Venn diagrams and solve problems involving union, intersection, and the complement of sets
2. perform algebraic expansion and factorization including binomial expansion using Pascal's triangle and quadratic factorization up to and including the method of decomposition
3. simplify expressions involving radicals and perform operations involving radicals including multiplication and division of radical terms and rationalizing the denominator
4. demonstrate an understanding of the Pythagorean theorem and employ it in solving 2D problems, including those involving diameters, chords, tangents, and triangles inscribed in a circle, and 3D problems including the diagonal of a box
5. perform slope, midpoint, and distance formula calculations and solve problems involving analytic geometry with emphasis on straight lines and the distance from a line to a point
6. understand the notions of congruency and similarity; create simple triangle congruence proofs; solve problems involving similar figures, and investigate the relationships among the lengths, areas, and volumes of similar figures
7. perform linear transformations such as translations, reflections, rotations, and dilatations upon points and figures, and, for curves, determine the equation of the image using the reverse linear transformation
8. summarize and analyze single variable discrete/grouped/cumulative data with a variety of statistics including mean, median, mode, range, and standard deviation; create and interpret graphical representations including column graphs, histograms, and box-and-whisker plots and relate these to normally distributed continuous data
9. demonstrate an understanding of the methods used to solve quadratic equations, including factorization, completing the square, and the quadratic formula, and solve problems that require these methods
10. demonstrate an understanding of the trigonometric ratios (sine, cosine, and tangent) for right angled triangles and apply these to problems in 2-D (including the formula for area of a triangle using sine) and 3-D; develop and apply the trigonometry for non-right-angled triangles, including the sine law and the cosine law, and prove simple trigonometric identities involving fractions, factorization, and the Pythagorean identity
11. analyze probabilistic situations and perform probability calculations for simple and compound events (including sampling without replacement), both experimentally and theoretically by using tree diagrams, tables, grids, and Venn diagrams, and calculate probabilities associated with unions and intersections of events, including mutually exclusive events and conditional probabilities
12. combine and simplify algebraic fractions having denominators of second degree or lower using the operations of multiplication, division, addition, and subtraction
13. rearrange formulas using algebraic operations (including n th roots) and develop formulas inductively from number patterns

14. demonstrate understanding of the concepts of relation and function, function notation, composition of functions, simple transformations of functions, inverse functions, absolute value functions, and intersection of functions, and develop and use the algebraic and recursive characterizations of arithmetic and geometric sequences
15. apply exponential and logarithmic functions to problems involving growth, decay, compound interest, and depreciation, and demonstrate facility with the laws of exponents (including trinomial factoring involving exponential terms) and the laws of logarithms
16. develop and apply procedures for finding the axis of symmetry, vertex, and intercepts of a quadratic function and apply these skills to quadratic optimization problems
17. demonstrate an understanding of the unit circle, radian measure, exact trigonometric values associated with 30° and 45° , and compound angle formulas, and apply these and previously developed transformational skills to graphing trigonometric functions, modelling with sine functions, solving simple trigonometric equations
18. analyze and solve inequalities involving quadratic and simple rational functions through the use of sign diagrams, interval notation, and graphs

Note: Any Pre-IB Mathematics 10 outcomes that may be developed for PowerSchool should be regarded as provisional; the additional Mathematics Pre-IB 10 outcomes will be reviewed at the end of the 2014–2015 school year.