

Grade 10 Applied Mathematics (1998) and Grade 10 Pre-Calculus Mathematics (1998)	Introduction to Applied and Pre-calculus Mathematics (2008)
Use words and algebraic expressions to describe the data and interrelationships in a table with rows/columns that are not related recursively (not calculated from previous data) (Applied A-1) Use words and algebraic expressions to describe the data and the interrelationships in a table with rows that are not related recursively (not calculated from previous data) (Pre-Calculus H-1)	
Use words and algebraic expressions to describe the data and the interrelationships in a table with rows that are related recursively (calculated from previous data) (Pre-Calculus H-2)	
Create and modify tables from both recursive and non-recursive situations (Applied A-2) Create and modify tables from both recursive and non-recursive situations (Pre-Calculus I-1)	
Use and modify a spreadsheet template to model recursive and non-recursive situations (Applied A-3) Use and modify a spreadsheet template to model recursive situations (Pre-Calculus G-7)	
Solve minimum/maximum problems (Applied A-4)	
Solve problems involving combinations of tables using: • Addition or subtraction of two tables • Multiplication of a table by a real number Spreadsheet functions and templates (Applied A-5)	
Classify numbers as natural, whole, integer, rational, or irrational, and show that these number sets are nested within the real number system (Applied B-1) Classify numbers as natural, whole, integer, rational, or irrational, and show that these number sets are nested within the real number system (Pre-Calculus D-1)	10I.A.2. Demonstrate an understanding of irrational numbers by • representing, identifying, and simplifying irrational numbers • ordering irrational numbers [CN, ME, R, V]
Use approximate representations of irrational numbers (Applied B-2) Use approximate representations of irrational numbers (Pre-Calculus D-2)	10I.A.2. Demonstrate an understanding of irrational numbers by • representing, identifying, and simplifying irrational numbers • ordering irrational numbers [CN, ME, R, V]
Communicate a set of instructions to solve an arithmetic problem (Applied B-3) Communicate a set of instructions used to solve an arithmetic problem (Pre-Calculus D-4)	
Perform arithmetic operations on irrational numbers using appropriate decimal approximations (Applied B-4) Perform operations on irrational numbers of monomial and binomial form, using exact values (Pre-Calculus D-5) Perform arithmetic operations on irrational numbers using appropriate decimal approximations (Pre-Calculus D-6)	10I.A.2. Demonstrate an understanding of irrational numbers by • representing, identifying, and simplifying irrational numbers • ordering irrational numbers [CN, ME, R, V]

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Use graphing technology for various applications (Applied B-5)	
Plot non-linear data using appropriate scales (Applied B-6) Plot linear and non-linear data, using appropriate scales (Pre-Calculus G-8)	10I.R.1. Interpret and explain the relationships among data, graphs, and contexts. [C, CN, R, T, V]
Read, write, and apply mathematical and technical language (Applied C-1)	
Plot linear data, using appropriate scales (Applied D-1)	
Determine the following characteristics of the graph of a linear function, given its equation: • Intercepts • Slope • Domain • Range (Applied D-2) Determine the following characteristics of the graph of a linear function, given its equation: • Intercepts • Slope • Domain • Range • Zeros (Pre-Calculus G-6)	10I.R.5. Determine the characteristics of the graphs of linear relations, including the • intercepts • slope • domain • range [CN, PS, R, T, V]
Use direct variation and arithmetic sequences as applications of linear functions (Applied D-3)	
Use direct variation and arithmetic sequences as applications of linear functions (Pre-Calculus I-2)	
Determine the volume of rectangular solids as the product of the area of the base and height; follow this with the volume of any figure whose base is a polygon, circle, or other recognizable geometric shape (Applied E-1)	
Calculate the volume and surface area of a sphere using formulas that are provided (Applied E-2)	
Calculate the volume and surface area of a sphere using formulas that are provided (Pre-Calculus E-1)	
Determine the relationships among linear scale factors, areas, surface areas, and volumes of similar figures and objects (Applied E-3)	
Determine the relationships among linear scale factors, areas, surface areas, and volumes of similar figures and objects (Pre-Calculus E-2)	
Interpret drawings and use the information to solve problems (Applied E-4)	
Interpret drawings and use the information to solve problems (Applied E-4)	10I.R.1. Interpret and explain the relationships among data, graphs and contexts. [C, CN, R, T, V]
Represent data, using function models (Applied F-1)	
Represent data, using function models (Pre-Calculus G-1)	10I.R.2. Demonstrate an understanding of relations and functions. [C, R, V]

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Describe a function in terms of: <ul style="list-style-type: none"> • Ordered pairs • A rule in word or equation form • A graph Describe relations and functions in terms of: <ol style="list-style-type: none"> a) Table of values b) Graph c) Ordered pairs d) Mapping e) Equation f) Rule 	10I.R.2. Demonstrate an understanding of relations and functions. [C, R, V] 10I.R.4. Describe and represent linear relations, using <ul style="list-style-type: none"> • words • ordered pairs • tables of values • graphs • equations [C, CN, R, V]
Use function notation to evaluate and represent functions (Applied F-3) Use function notation to evaluate and represent functions (Pre-Calculus G-5)	10I.R.8. Represent a linear function, using function notation. [CN, ME, V]
Use a graphing tool to draw the graph of a function or relation from its equation (Applied F-4) Use a graphing tool to draw the graph of a function from its equation (Pre-Calculus G-4)	10I.R.4. Describe and represent linear relations, using <ul style="list-style-type: none"> • words • ordered pairs • tables of values • graphs • equations [C, CN, R, V]
Determine the domain and range of a relation from its graph (Applied F-5) Determine the domain and range of a relation from its grap (Pre-Calculus G-3)	10I.R.5. Determine the characteristics of the graphs of linear relations, including the <ul style="list-style-type: none"> • intercepts • slope • domain • range [CN, PS, R, T, V]
Solve problems involving distances between points in the coordinate plane (Applied G-1) Solve problems involving distances between points in the coordinate plane (Pre-Calculus B-1)	10I.R.10. Solve problems that involve the distance between two points and the midpoint of a line segment. [C, CN, PS, T, V]
Solve problems involving the midpoints of line segments (Applied G-2) Solve problems involving midpoints of line segments (Pre-Calculus B-2)	10I.R.10. Solve problems that involve the distance between two points and the midpoint of a line segment. [C, CN, PS, T, V]
Solve problems involving rise, run, and slope of line segments (Applied G-3) Solve problems involving rise, run, and slope of line segments (Pre-Calculus B-3)	10I.R.3. Demonstrate an understanding of slope with respect to <ul style="list-style-type: none"> • rise and run • line segments and lines • rate of change • parallel lines • perpendicular lines [PS, R, V]

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Solve problems using slopes of: <ul style="list-style-type: none"> • Parallel lines • Perpendicular lines (Applied G-4) Solve problems using slopes of: <ul style="list-style-type: none"> • Parallel lines • Perpendicular lines (Pre-Calculus B-6)	10I.R.3. Demonstrate an understanding of slope with respect to <ul style="list-style-type: none"> • rise and run • line segments and lines • rate of change • parallel lines • perpendicular lines [PS, R, V]
Select and apply appropriate instruments, units of measure (in both SI and imperial systems) and measurement strategies to find lengths, areas, and volumes (Applied H-1)	10I.M.1. Solve problems that involve linear measurement, using <ul style="list-style-type: none"> • SI and imperial units of measure • estimation strategies • measurement strategies [ME, PS, V]
Analyze the limitations of measuring instruments and measurement strategies, using the concepts of precision and accuracy (Applied H-2)	10I.M.1. Solve problems that involve linear measurement, using <ul style="list-style-type: none"> • SI and imperial units of measure • estimation strategies • measurement strategies [ME, PS, V]
Solve problems involving length, area, volume, time, mass, and rates derived from these (Applied H-3)	10I.M.3. Solve problems, using SI and imperial units, that involve the surface area and volume of 3-D objects, including <ul style="list-style-type: none"> • right cones • right cylinders • right prisms • right pyramids • spheres [CN, PS, R, T, V]
Interpret Scale Drawings and use the information to solve problems (Applied H-4)	
Solve problems involving two right triangles, including angles of depression and elevation (Applied I-1) Solve problems using a right triangle that involves the angles of elevation and depression (Pre-Calculus C-1) Solve problems involving two right triangles (Pre-Calculus C-2)	10I.M.4. Develop and apply the primary trigonometric ratios (sine, cosine, tangent) to solve problems that involve right triangles. [C, CN, PS, R, T, V]
Extend the concepts of sine and cosine for angles 0° to 180° (Applied I-2) Extend the concepts of sine and cosine for angles from 0° to 180° (Pre-Calculus C-3)	
Apply the sine and cosine laws, excluding the ambiguous case, to solve problems (Applied I-3) Apply the sine and cosine laws, excluding the ambiguous case, to solve problems (Pre-Calculus C-4)	

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Choose, justify and apply sampling techniques that will result in an appropriate unbiased sample from a given population (Applied J-1)	
Choose, justify, and apply sampling techniques that will result in an appropriate, unbiased sample from a given population (Pre-Calculus H-3)	
Draw and communicate inferences about the population from which a sample was taken (Applied J-2)	
Defend or oppose, as appropriate, generalizations made about populations based on data from samples (Applied J-3)	
Defend or oppose inferences and generalizations about populations, based on data from samples (Pre-Calculus H-4)	
Determine the equation of the line of best fit, using: <ul style="list-style-type: none"> • Estimate of slope and one point • Median-median method • Least squares method with technology (Applied J-4) 	
Use technological devices to determine the correlation coefficient r (Applied J-5)	
Interpret the correlation coefficient r and its limitations for varying problem situations, using relevant scatterplots (Applied J-6)	
Find the product of polynomials (Pre-Calculus A-1)	10I.A.4. Demonstrate an understanding of the multiplication of polynomial expressions (limited to monomials, binomials, and trinomials), concretely, pictorially, and symbolically. [C, CN, R, V]
Divide a polynomial (P) by a binomial (D), and express the result in the forms: <ul style="list-style-type: none"> • $\frac{P}{D} = Q + \frac{R}{D}$ • $P = DQ + R$ • $P(x) = D(x)Q(x) + R$ (Pre-Calculus A-2) 	
Factor polynomial expressions of the form $ax^2 + bx + c$ and $a^2x^2 - b^2y^2$ (Pre-Calculus A-3)	10I.A.5. Demonstrate an understanding of common factors and trinomial factoring, concretely, pictorially, and symbolically. [C, CN, R, V]

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Graph linear equations using: i) table of values ii) intercepts iii) slope and y-intercept iv) technology (Pre-Calculus B-4)	10I.R.4. Describe and represent linear relations, using <ul style="list-style-type: none"> • words • ordered pairs • tables of values • graphs • equations [C, CN, R, V] 10I.R.6. Relate linear relations expressed in <ul style="list-style-type: none"> • slope–intercept form ($y = mx + b$) • general form ($Ax + By + C = 0$) • slope–point form ($y - y_1 = m(x - x_1)$) to their graphs. [C, CN, R, T, V]
Determine the equation of a line, given information that uniquely determines the line (Pre-Calculus B-5)	10I.R.6. Relate linear relations expressed in <ul style="list-style-type: none"> • slope–intercept form ($y = mx + b$) • general form ($Ax + By + C = 0$) • slope–point form ($y - y_1 = m(x - x_1)$) to their graphs. [C, CN, R, T, V] 10I.R.7. Determine the equation of a linear relation, given <ul style="list-style-type: none"> • a graph • a point and the slope • two points • a point and the equation of a parallel or perpendicular line • a scatterplot [C, CN, PS, R, T, V]
Explain and apply the exponent laws for powers of numbers and for variables with rational exponents (Pre-Calculus D-3)	10I.A.3. Demonstrate an understanding of powers with integral and rational exponents. [C, CN, PS, R]
Justify specific properties of quadrilaterals (Pre-Calculus E-3)	
Apply the properties of quadrilaterals in solving algebra and coordinate geometry problems (Pre-Calculus E-4)	

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Determine the non-permissible values for the variable in rational expressions (Pre-Calculus F-1)	
Determine equivalent forms of simple rational expressions with polynomial numerators, and denominators that are monomials, binomials, or trinomials that can be factored (Pre-Calculus F-2)	
Perform the operations of multiplication, division, addition and subtraction on rational expressions (Pre-Calculus F-3)	
Find and verify the solutions of rational equations (Pre-Calculus F-4)	
Connect probabilities to calculated expected gains or losses (Pre-Calculus H-5)	
Relate arithmetic sequences to linear functions defined over the natural numbers (Pre-Calculus I-3)	
Generate number patterns exhibiting arithmetic growth (Pre-Calculus I-4)	
Use expressions to represent general terms and sums for arithmetic growth, and apply these expressions to solve problems (Pre-Calculus I-5)	
Generate number patterns exhibiting geometric growth (Pre-Calculus I-6)	
	10I.R.9. Solve problems that involve systems of linear equations in two variables, graphically and algebraically. [CN, PS, R, T, V]
	10I.A.1. Demonstrate an understanding of factors of whole numbers by determining <ul style="list-style-type: none"> • prime factors • greatest common factor • least common multiple • square root • cube root [CN, ME, R]
	10I.M.2. Apply proportional reasoning to problems that involve conversions within and between SI and imperial units of measure. [C, ME, PS, T]