

Grade Ten Algebra & Trigonometry Curriculum

Unit of Study: Functions

Curriculum Standards	Learner Outcomes
The language of algebra	<ul style="list-style-type: none">• Evaluate expressions and formulas including correct units in answers.• Use addition, subtraction, multiplication and division to write expressions which model real world situations.
Definition of a function	<ul style="list-style-type: none">• Determine whether a relation is a function.• Determine the domain and range of a function defined by a table, a list of ordered pairs, or a simple equation.
Graphs of functions	<ul style="list-style-type: none">• Determine the domain, range, and values of a function from its graph.• Apply the vertical line test for a function.
Solving equations	<ul style="list-style-type: none">• Solve and check linear equations.• Use linear equations to solve real world problems.

Unit of Study: Variation and Graphs

Curriculum Standards	Learner Outcomes
Direct variation	<ul style="list-style-type: none">• Recognize direct variation situations.• Translate direct variation language into formulas.
Inverse variation	<ul style="list-style-type: none">• Recognize inverse variation situations.• Translate inverse variation language into formulas.
The graph of linear equations	<ul style="list-style-type: none">• Identify properties of variation functions.• Graph variation equations.• Find slopes.
The graph of quadratic equations	<ul style="list-style-type: none">• Find rates of change.• Graph simple quadratic equations.
Fitting a model to data	<ul style="list-style-type: none">• Find equations that describe data.• Fit an appropriate model to data.

Unit of Study: Linear Functions

Curriculum Standards	Learner Outcomes
Constant increase or constant decrease situations	<ul style="list-style-type: none">Recognize properties of linear functions.Determine slope and y intercept of a line given the equation.
The graph of $y=mx+b$	<ul style="list-style-type: none">Find an equation for a line given a point on it and its slope.Graph linear functions.
The graph of $Ax+By=C$	<ul style="list-style-type: none">Determine the slope of a line from the standard form equation.Determine the x and y intercepts on a line from the standard form equation.
Fitting a line to data	<ul style="list-style-type: none">Fit a line to data using two points.Fit a line of best fit to data using the least squared method.

Unit of Study: Matrices

Curriculum Standards	Learner Outcomes
Storing data in matrices	<ul style="list-style-type: none">Use matrix terminology.Use matrices to store data.
Matrix addition	<ul style="list-style-type: none">Add and subtract matrices.Find scalar multiples of matrices.
Matrix multiplication	<ul style="list-style-type: none">Multiply matrices.Recognize properties of matrix multiplication.
Matrices for size changes	<ul style="list-style-type: none">Recognize relationships between figures and their size change images.Relate size changes to matrices.
Matrices for scale changes	<ul style="list-style-type: none">Recognize relationships between figures and their scale change images.Relate scale changes to matrices.
Matrices for reflections	<ul style="list-style-type: none">Recognize relationships between figures and their reflection images.Relate reflections to matrices.

Unit of Study: Systems

Curriculum Standards	Learner Outcomes
Inequalities and compound sys	<ul style="list-style-type: none">Solve and graph linear inequalities in one variable.
Solving systems by substitution	<ul style="list-style-type: none">Solve 2 x 2 and 3 x 3 systems using substitution.Recognize properties of systems of equations.Use systems of two or three linear equations to solve real world problems.
Solving systems using linear combinations	<ul style="list-style-type: none">Solve 2 x 2 and 3 x 3 systems using the linear combination method.

Unit of Study: Quadratic Functions

Curriculum Standards	Learner Outcomes
Quadratic expressions	<ul style="list-style-type: none">• Expand squares of binomials.
Completing the square	<ul style="list-style-type: none">• Transform quadratic equations from standard form to vertex form.
Fitting a quadratic model to data	<ul style="list-style-type: none">• Describe data either exactly or approximately by quadratic functions.
The quadratic formula	<ul style="list-style-type: none">• Apply the quadratic formula to solve problems.

Unit of Study: Powers

Curriculum Standards	Learner Outcomes
Power functions	<ul style="list-style-type: none">• Solve real world problems which can be modeled by expressions with nth power functions.
Properties of powers	<ul style="list-style-type: none">• Simplify expressions using properties of exponents.• Model real world problems by using expressions with nth powers.
Negative Integer Exponents	<ul style="list-style-type: none">• Evaluate negative integer expressions.• Simplify expressions using the negative integer theorem.
Compound interest	<ul style="list-style-type: none">• Solve real world problems which can be modeled by expressions with nth powers.• Apply the compound interest formula..

Unit of Study: Exponential and Logarithmic Functions

Curriculum Standards	Learner Outcomes
Exponential growth and decay	<ul style="list-style-type: none">• Recognize properties of exponential functions.• Apply exponential growth models.
Common logarithms	<ul style="list-style-type: none">• Determine values of common logarithms.• Solve common logarithm equations.

Unit of Study: Trigonometry

Curriculum Standards	Learner Outcomes
Three trigonometry functions	<ul style="list-style-type: none">• Solve real world problems using the trigonometry of right triangles.
More right triangle trigonometry	<ul style="list-style-type: none">• Determine the measure of an angle given its sine, cosine or tangent.
The law of cosines	<ul style="list-style-type: none">• Find missing parts of a triangle using the law of cosines.• Solve real world problems using the law of cosines.
The law of sines	<ul style="list-style-type: none">• Find missing parts of a triangle using the law of sines.• Solve real world problems using the law of sines.

Unit of Study: Polynomials

Curriculum Standards	Learner Outcomes
Definition of a polynomial	<ul style="list-style-type: none">• Use technical vocabulary to define and discuss polynomials.• Graph polynomial functions.
Polynomials and geometry	<ul style="list-style-type: none">• Use the extended distributive property to multiply polynomials.• Use polynomials to describe geometric situations.
Factoring special cases	<ul style="list-style-type: none">• Factor polynomials using common monomial factoring.• Factor polynomials using perfect square patterns.

Unit of Study: Quadratic Relations

Curriculum Standards	Learner Outcomes
Parabolas	<ul style="list-style-type: none">• Write equations for parabolas given sufficient conditions.• Find points on a parabola using its definition.
Circles	<ul style="list-style-type: none">• Write equations for circles given sufficient conditions.• Identify characteristics of circles.

Unit of Study: Series and Combinations

Curriculum Standards	Learner Outcomes
Arithmetic series	<ul style="list-style-type: none">• Calculate values of a finite arithmetic series.• Solve real world problems using arithmetic series.
Geometric series	<ul style="list-style-type: none">• Calculate values of finite geometric series.• Solve real world problems using geometric series.
The binomial theorem	<ul style="list-style-type: none">• Expand binomials.

Math Resources

Educational Support Materials	Technology Integration
<i>Advanced Algebra</i> , University of Chicago Mathematics Project (UCSMP) Wright Group/McGraw Texas Instrument 84+ calculator	Software: TI Smartview Plus (for projection) Microsoft Excel Websites: http://hotmath_help/gamse/kp/kp_hotmath_sound.swf