

ESL SECONDARY MATHEMATICS PLACEMENT TEST

Summary of the Ministry Expectations by Grades:

PART	GRADE	EXPECTATIONS
1	Grade 8	Number Sense and Numeration: Add, subtract, multiply, divide whole numbers, decimals, integers and fractions; Order of Operations; Convert fraction to percent, find percent of a number; Solve proportional problems, and evaluate simple square roots.
		Measurement: Find the perimeter and area of regular and irregular shapes.
		Algebra: Evaluate algebraic expressions by substituting the given values for the variables. Solving one-step and two-step linear equations with one variable.
		Geometric Relationship: Find the missing angles in triangles and polygons.
A	Grade 9 Applied	Demonstrate facility with critical number skills (integers) Demonstrate facility with critical number skills (rational numbers) Evaluate numerical expressions involving natural number exponents with rational number bases.
		Select the equations of straight lines from a given set of equations of linear and non-linear relations
		Solve first degree equations, excluding equations with fractional coefficients
		Calculate side in a right triangle using the Pythagorean Theorem
		Determine equation of a line, given the slope and y-intercept
		Determine values of a linear relation by using the formula of the relation
		Plot points on the x-y plane; and graph lines without technology
		Construct formulas to represent linear relations derived from descriptions of realistic situations
		Illustrate and explain the properties of interior and exterior angles of triangles and of angles related to parallel lines
		Solve problems involving the area of composite plan figures
		Solve problems using the formula for the volume of cylinders
B	Grade 9 Academic	Apply the exponent rules for multiplying and dividing powers of same bases, power of a power, and negative exponents
		a) Add and subtract polynomial b) Multiply a polynomial by a monomial
		Solve first-degree equations using multi-steps
		Factor a polynomial by using the Greatest Common Factor
		Solve the linear equation for the indicated variable in the form $y = mx + b$

C	Grade 10 Applied	Solve problems involving percent, ratio, rate, and proportion
		Solve first-degree equations in one variable, including fractional coefficients
		Rearrange the equations from the form $y = mx + b$ to the form $Ax + By + C = 0$
		Solve Linear System of Equations in two variables by algebraic methods-substitution or elimination
		<ul style="list-style-type: none"> a) Name the similar triangles from a given diagram, and b) Using proportional relations to find the unknown side.
		Determine <ul style="list-style-type: none"> a) The side of a right triangle when one acute angle and one side are given b) The acute angle when two sides are given by using the primary trigonometric ratios
		Explain the role of a, h, and k in the graph of quadratic function $Y = a(x - h)^2 + k$
		<ul style="list-style-type: none"> a) Multiply two binomials using FOIL and a square of a binomial b) Expand and simplify polynomial expressions the multiply of two binomials and a square of a sum
		<ul style="list-style-type: none"> a) Factor fully a difference of squares b) Factor a trinomial in the form $x^2 + bx + c$
		Solve quadratic equations by factoring or using the quadratic formula
D	Grade 10 Academic	Use Formulas for midpoint and slope to solve the problems
		Factor polynomial expressions involving common factors, differences of squares, and trinomials in the form $ax^2 + bx + c$
		Sketch the graph of a quadratic function in vertex form
		Express the equation of a quadratic function in the standard form $ax^2 + bx + c$ to the vertex form $y = a(x-h)^2 + k$ using the algebraic method of completing the square.
		<ul style="list-style-type: none"> a) Solve quadratic equations by factoring b) Solve quadratic equations using the quadratic formula
		Calculate the measures of sides and angles in acute triangles, using the sine law and cosine law
E	Grade 11 College	Sketch the graph of simple exponential functions, given their equations $y = b^x$, where $b > 0$, and $b \neq 1$; identify the key properties of exponential functions
		Evaluate simple numerical expressions involving powers with rational exponents
		Simplify algebraic expressions involving integral exponents, using the law of exponents
		Solve exponential equations involving common bases
		Determine terms that follow three or more given terms in a

		sequence; determine whether a sequence is arithmetic or geometric, or neither
		Solve problems relate to the formulas for the nth term and the sum of the nth term of arithmetic and geometric sequences and series
		Solve problems involving the calculation of any variable in the simple interest formula $I = PRT$
		Solve problems involving the calculation o the amount in the compound-interest formula $A = P(1 + i)^n$
		Solve problems involving the calculation of the amount and the regular payment in the formula for the amount of an ordinary annuity
F	Grade 11 College/ University	Determine the sine, cosine, and tangent of angles greater than 90^0 or $\Pi/2$, using a suitable technique
		Solve problems in two dimensions involving oblique triangles using the sine law and cosine law (including the ambiguous case)
		Convert <ul style="list-style-type: none"> a) Degree to radian b) Radian to degree
		Solve linear and quadratic trigonometric equations on the interval $0 \leq x \leq 4\Pi$
		Prove simple identities
		Sketch the graphs of $y = \sin x$ and $y = \cos x$, and describe their periodic properties
		Determine the amplitude, period, phase shift, domain, and range of sinusoidal functions whose equations are given
		Sketch the graphs o simple sinusoidal functions
		Sketch the graph of $y = \tan x$; identify the period, domain, and range of the function and explain the occurrence of asymptotes
		Write equation of a sinusoidal function, given its graph and given its properties
		Simplify and evaluate expressions containing integer and rational exponents, using the law of exponents
		Solve the first-degree inequalities and represent the solutions on number lines
		Identify the structure of the complex number system and express complex numbers in the form $a + bi$; determine the real or complex roots of quadratic equations, using an appropriate method
		Add, subtract, multiply, and divide rational expressions, and state the restrictions on the variable values
		Demonstrate facility in the use of function notation for substituting into and evaluating functions; represent inverse functions, using function notation
		Determine the properties of the functions $f(x) = \sqrt{x}$, and $f(x)=1/x$

G	Grade 11 University	Determine an equation to represent a described locus
		Determine equations for conics from their locus definitions
		Determine the key features of a conic
		Sketch the graph of a conic
		Identify the type of conic, given its equation in the form $ax^2 + by^2 + 2gx + 2fy + c = 0$