



Precalculus Semester 1 Final Assessment Blueprint		
Year: 2024-2025	Method of Delivery: Online	
Subject: Math	Administration Window: December 9-19	

Resources
Pre-calculus Curriculum Map

Standards At-A Glance		
Standard	Number of Items	Standard Description
MA.9-12.A2.A-APR.B.3	3	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial. Focus on quadratic, cubic, and quartic polynomials including polynomials for which factors are not provided.
MA.9-12.A2.A-APR.D.6	2	Rewrite rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or for the more complicated examples, a computer algebra system.
MA.9-12.A2.A-REL.C.7	1	Solve a system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.
MA.9-12.A2.F-BF.A.1	2	Write a function that describes a relationship between two quantities. Functions include linear, quadratic, exponential, polynomial, logarithmic, rational, sine, cosine, tangent, square root, cube root and piecewise-defined functions. Include problem-solving opportunities utilizing real-world context.
MA.9-12.A2.F-BF.B.3	1	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, and $f(x - k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. Functions include linear, quadratic, exponential, polynomial, logarithmic, rational, sine, cosine, tangent, square root, cube root and piecewise-defined functions.
MA.9-12.A2.F-BF.B.4	3	Find inverse functions.
MA.9-12.A2.F-IF.B.4	2	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Include problem-solving opportunities utilizing a real-world context. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. Functions include linear, quadratic, exponential, polynomial, logarithmic, rational, sine, cosine, tangent, square root, cube root and piecewise-defined functions.
MA.9-12.A2.F-IF.B.6	2	Calculate and interpret the average rate of change of a continuous function (presented symbolically or as a table) on a closed interval. Estimate the rate of change from a graph. Include problem-solving opportunities utilizing real-world context. Functions include linear, quadratic, exponential, polynomial, logarithmic, rational, sine, cosine, tangent, square root, cube root and piecewise-defined functions.
MA.9-12.A2.F-IF.C.7	2	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Functions include linear, quadratic, exponential, polynomial, logarithmic, rational, sine, cosine, tangent, square root, cube root and piecewise-defined functions.
MA.9-12.A2.F-IF.C.8	1	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
MA.9-12.A2.F-LE.A.4	5	For exponential models, express as a logarithm the solution to $a b^t = c$ to the $c t$ power = d where a , c , and d are numbers and the base b is 2, 10, or e ; evaluate the logarithms that are not readily found by hand or observation using technology.
MA.9-12.A2.F-LE.B.5		Interpret the parameters in an exponential function with rational exponents utilizing real-world context.
MA.9-12.P-F-BF.A.1	1	Write a function that describes a relationship between two quantities.
MA.9-12.P-F-BF.B	1	Build new functions from existing functions.
MA.9-12.P-G-GPE.A.2	3	Derive the equation of a parabola given a focus and directrix.
MA.9-12.P-G-GPE.A.3		Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.
MA.9-12.P.N-VM.C.10	1	Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.
MA.9-12.P.N-VM.C.7	1	Multiply matrices by scalars to produce new matrices.
MA.9-12.P.N-VM.C.8	1	Add, subtract, and multiply matrices of appropriate dimensions.
MA.9-12.RFR.AF.3		Interpret key features of graphs and tables for a function that models a relationship between two quantities in terms of the quantities.
MA.9-12.RFR.AF.4	1	Use limits to describe long-range behavior, asymptotic behavior, and points of discontinuity.
MA.9-12.RFR.BF.2	1	Model relationships through composition and attend to the restrictions of the domain.
MA.9-12.RM.UM.2	1	Use matrix operations to solve problems. Add, subtract, and multiply matrices of appropriate dimensions. Multiply matrices by scalars to produce new matrices.
MA.9-12.RM.UM.3	1	Find the inverse and determinant of a matrix.
MA.9-12.RT.EPE.3	1	Use polar equations to solve problems.
MAT152.1.0	1	Define, distinguish, and interpret the relations and functions and their inverses represented verbally, graphically, numerically, or algebraically. (I-VII)
MAT152.2.0	1	Calculate and interpret the average rate of change in varied contexts, using function notation including the difference quotient. (I)
MAT152.3.0	1	Evaluate functions and solve function equations and inequalities using multiple methods. (I-VII)
MAT152.5.0	1	Identify, graph, analyze, and determine the key characteristics of the following function types and their transformations: polynomial, power, radical, rational, exponential, logarithmic, absolute value, piecewise-defined, and discrete. (I-VII)
MAT152.6.0	1	Model real world situations using a variety of mathematical techniques (including regression) and solve real world mathematical problems using functions and function compositions. (I-IX)

*Some items may be tagged to more than one standard.

Depth of Knowledge	
DOK	Number of Items
Level 1: Recall	1
Level 2: Skill/Concept	25
Level 3: Strategic Thinking	9

Item Types Included		
Type	Number of Items	Description
MC	35	Multiple Choice - Select one answer