FEDERAL WAY PUBLIC SCHOOLS

Standards-Based Education
Priority Standards

Pre-Calculus

Expressions Reporting Standard
A.APR.D.6 Rewrite simple rational expressions in different forms.
A.APR.D.7 Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expressions; add, subtract, multiply and divide rational expressions.
A.SSE.B.3.a Factor a quadratic expression to reveal the zeros of the function it defines.
A.SSE.B.3.b Complete the square in a quadratic to reveal the maximum or minimum value of the function it defines.
N.CN.A.2 Use the relation of i squared = -1 and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
N.CN.A.3 Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers.
N.CN.B.4 Represent complex numbers on a complex plan in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number
N.CN.B.5 Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane, use properties of this representation for computation.
Equations and Inequalitites Reporting Standard
A.APR.B.2 Know and apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by x -a is p(a), so p(a) = 0 if and only if (x - a) is a factor of p(x).
A.APR.B.3 Identify zeros of polynomials when suitable factorizations are variable and use the zeros to construct a rough graph of the function defined by the polynomial.
A.REI.A.2 Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
A.REI.B.4.a Use the method of completing the square to transform any quadratic equation in x into an equation of the form (x -p) squared = q that has the same solutions. Derive the quadratic formula form this form.
A.REI.B.4.b Solve quadratic equations by inspection, taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a + bi for real numbers a and b.
N.CN.C.8 Extend polynomial identities to the complex numbers.

C1 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.
A.APR.B.2 Know and apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by x -a is p(a), so p(a) = 0 if and only if (x - a) is a factor of p(x).
Graphing Reporting Standard
F.IF.C.7.a Graph linear and quadratic functions and show intercepts, maxima, and minima.
F.IF.C.7.b Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
F.IF.C.7.c Graph polynomial functions, identify zeros when suitable factorizations are available, and show end behavior.
F.IF.C.7.d Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.
F.IF.C.7.e Graph exponential functions, showing intercepts and end behavior.
C2 Write an equation in standard form to identify whether the graph of the equation is a circle, ellipse, parabola, or hyperbola and graph.
Writing Functions Reporting Standard
F.IF.8.a Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
F.IF.8.b Use the properties of exponents to interpret expressions for exponential functions.
F.BF.A.1 Write a function that describes a relationship between two quantities.
F.BF.A.1.c Compose functions.
F1 Demonstrate an understanding of functions and equations defined parametrically and graph them.
F2 Graph polar coordinates and curves. Convert between polar and rectangular coordinate systems.
Building Functions Reporting Standard
F.BF.B.3 Identify the effect on the graph of replacing f(x) by f(x) + k, kf(x), f(kx), and f(x+k) for specific values of k (both positive and negative); find the value of k given the graphs.
F.BF.B.5 Understand the inverse relationship between exponents and logarithms and use the relationship to solve problems involving logarithms and exponents.
F.LE.A.2 Construct linear and exponential functions, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table). F.LE.A.4 For exponential models, express as a logarithm and evaluate the logarithm.
F3 Solving word-problems that model change using linear, quadratic, radical, rational, trigonometric, and exponential functions.
Probability Reporting Standard
S.CP.A.2 Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities and use this characterization to determine if they are independent.

	S.CP.B.7 Apply the Addition Rule, P(A or B) = P(A)+P(B) - P(A and B), and interpret the answer in terms of the model.
	S.CP.B.8 Apply the general Multiplication Rule in a uniform probability model, P(A and B) = P(A)P(B|A) = P(B)P(A|B) and interpret the answer in terms of the model.
	S.CP.B.9 Use permutations and combinations to compute probabilities of compound events and solve problems.
	S.MD.A.1 Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space. Graph the corresponding probability using the same graphical displays as for data distributions.
	S.MD.A.2 Calculate the expected value of a random variable, interpret it as the mean of the probability distribution
Trigonometric Reporting Standard	
	F.TF.A.3 Use special triangles to determine geometrically the values of sine, cosine, tangent, for certain angle measures and use the unit circle to express the values of sine, cosine, and tangent in terms of their values for s, where x is any real number.
	F.TF.A.4 Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.
	F.TF.B.7 Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology and interpret them in terms of the context.
	F.TF.C.8 Prove the Pythagorean identity and use it to find sin, cos, or tan given sine, cos, or tan and the quadrant of the angle.
	F.TF.C.9 Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.
	G.SRT.D.9 Derive the formula A = 1/2 ab sin c for the area of a triangle by drawing an auxiliary line from the vertex perpendicular to the opposite side.
	G.SRT.D.11 Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles.
	TF1 Prove the half angle and double angle identities for sine and cosines and use them to solve problems.
Vector and Matrix Reporting Standard	
	A.REI.C.9 Find the inverse of a matrix if it exists and use it to solve systems of linear equations.
	N.VM.A.1 Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments and use appropriate symbols for vectors and their magnitudes.
	N.VM.A.3 Solve problems involving velocity and other quantities that can be represented by vectors.
	N.VM.B.4.a Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.

	N.VM.B.4.b Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.
	N.VM.B.4.c Understand vector subtraction v - w as v + (-w) is the additive inverse of w, with the same magnitude as w and pointing the opposite direction. Represent vector subtraction graphically by connecting the tips in the appropriate order and perform vector subtraction component-wise.
	N.VM.C.8 Add, subtract, and multiply matrices of appropriate dimensions.
	N.VM.C.9 Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but sill satisfies the associative and distributive properties.
	N.VM.C.10 Understand that the zero and identify 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.