

Mathematical Analysis 2011-2012 Benchmark Blueprint

Green Dot Public Schools

Assessments

Geometry	1	2	3	4
15.0 Students use the Pythagorean theorem to determine distance and find missing lengths of sides of right triangles.	3	3		
18.0 Students know the definitions of the basic trigonometric functions defined by the angles of a right triangle. They also know and are able to use elementary relationships between them. For example, $\tan(x) = \sin(x) / \cos(x)$, $(\sin(x))^2 + (\cos(x))^2 = 1$.	3			
19.0 Students use trigonometric functions to solve for an unknown length of a side of a right triangle, given an angle and a length of a side.	3			
21.0 Students prove and solve problems regarding relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles.		3		
Algebra II	1	2	3	4
4.0 Students factor polynomials representing the difference of squares, perfect square trinomials, and the sum and difference of two cubes.		3		
7.0 Students add, subtract, multiply, divide, reduce, and evaluate rational expressions with monomial and polynomial denominators and simplify complicated rational expressions, including those with negative exponents in the denominator.		3		
8.0 Students solve and graph quadratic equations by factoring, completing the square, or using the quadratic formula. Students apply these techniques in solving word problems. They also solve quadratic equations in the complex number system.	3			
10.0 Students graph quadratic functions and determine the maxima, minima, and zeros of the function.	3			
16.0 Students demonstrate and explain how the geometry of the graph of a conic section (e.g., asymptotes, foci, eccentricity) depends on the coefficients of the quadratic equation representing it.		3		
18.0 Students use fundamental counting principles to compute combinations and permutations.				3
19.0 Students use combinations and permutations to compute probabilities.				3
Mathematical Analysis	1	2	3	4
1.0 Students are familiar with, and can apply, polar coordinates and vectors in the plane. In particular, they can translate between polar and rectangular coordinates and can interpret polar coordinates and vectors graphically.			3	
2.0 Students are adept at the arithmetic of complex numbers. They can use the trigonometric form of complex numbers and understand that a function of a complex variable can be viewed as a function of two real variables. They know the proof of DeMoivre's theorem.			3	3
3.0 Students can give proofs of various formulas by using the technique of mathematical induction.				3



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Mathematical Analysis (continued)		1	2	3	4
4.0	Students know the statement of, and can apply, the fundamental theorem of algebra.	3		3	
5.1	Students can take a quadratic equation in two variables; put it in standard form by completing the square and using rotations and translations, if necessary; determine what type of conic section the equation represents; and determine its geometric components (foci, asymptotes, and so forth).	3		3	
5.2	Students can take a geometric description of a conic section---for example, the locus of points whose sum of its distances from (1, 0) and (-1, 0) is 6---and derive a quadratic equation representing it.		3		3
6.0	Students find the roots and poles of a rational function and can graph the function and locate its asymptotes.		3		3
8.0	Students are familiar with the notion of the limit of a sequence and the limit of a function as the independent variable approaches a number or infinity. They determine whether certain sequences converge or diverge.				3
Total Number of Items		21	21	12	21