MATHEMATICS
Structuring Competencies in a Definitive Budget of Work

GRADE	GRADE 9			
GRADE LEVEL STANDARD	The learner demonstrates understanding of key concepts and principles of patterns and algebra (quadratic equations and inequalities, quadratic functions , rational algebraic equations, variations and radicals) and geometry (parallelograms and triangle similarities and basic concept of trigonometry) as applied using appropriate technology - in critical thinking, problem solving, reasoning, communicating, making connections, representations and decisions in real life.			
Grade 9 - FIRST QUARTER				
PERFORMANCE STANDARDS	The learner is able to investigate thoroughly mathematical relationships in various situations, formulate real- life problems involving quadratic equations, inequalities and functions, and rational algebraic equations and solve them using a variety of strategies			
CONTENT STANDARDS	the learner demonstrates understanding of key concepts of quadratic equations, inequalities, functions and rational algebriac equations			
Content Areas/Strand	**Patterns and Algebra**			
	LEARNING COMPETENCIES	**CODE**	**NO. OF DAYS TAUGHT**	**REMARKS**
	The learner…			
	1. Illustrate quadratic equations.	M9AL-Ia-1	1	
	2. Solves quadratic equations by: (a) extracting square roots; (b) factoring; (c) completing the square; and (d) using the quadratic formula.	M9AL-Ia-2.0		

	2.1 solves quadratic equations by: (a) extracting square roots and (b) factoring;	M9AL-Ia-2.1	2	
	2.2 solves quadratic equations by: (c) completing the square; and	M9AL-Ia-b-2.2	2	1
	2.3 solves quadratic equations by: (d) using the quadratic formula.	M9AL-Ib-2.3	1	
	3. Characterizes the roots of a quadratic equation using the discriminat	M9AL-Ib-3	1	
	4. Describes the relationship between the coefficients and the roots of a quadratic equation.	M9AL-Ib-c-4	2	1
	5. Solves equations transformable to quadratic equations(including rational algebraic equations).	M9AL-Ic-5	3	
	6. Solves problems involving quadratic equations and rational algebraic equations.	M9AL-Id-6.0		
	6.1 solves problems involving quadratic equations and rational algebraic equations.	M9AL-Id-6.1	2	
	6.2 solves problems involving quadratic equations and rational algebraic equations.	M9AL-Id-6.2	2	
	7. Illustrates quadratic inequalties.	M9AL-Ie-7	2	
	8. Solves quadratic inequalities.	M9AL-Ie-8	2	
	9. Solves problems involving quadratic inequalities.	M9AL-If-9	2	
	10. Models real-life situation using quadratic functions.	M9AL-If-10	2	

	11. Represents a quadratic function using : (a) table of values, (b) graph, and (c) equation.	M9AL-Ig-11.0		
	11.1 represents a quadratic function using : (a) table of values and (b) graph, and (c) equation, and ;	M9AL-Ig-11.1	1	
	11.2 represents a quadratic function using : (c) equation.	M9AL-Ig-11.2	1	
	12. Transforms the quadratic function in general form $y = ax^2 + bx + c$ into standard form (vertex form) $y = a(x-h)^2 + k$ and vice versa.	M9AL-Ig-12.0		
	12.1 transforms the quadratic function in general form $y = ax^2 + bx + c$ into standard form (vertex form) y = a(x-h)2 + k	M9AL-Ig-12.1	2	
	12.2 transforms the quadratic function in standard form into general form $y = ax^2 + bx + c$.	M9AL-Ih-12.2	1	
	13. Graphs a quadratic function and determine the following: a) domain, b) range c) intercepts, d) axis of symmetry, e) vertex, f) direction of the opening of the parabola.	M9AL-Ih-13.0		
	13.1 graphs a quadratic function	M9AL-Ih-13.1	2	
	13.2 determine the following: a) domain, b) range c) intercepts, d) axis of symmetry, e) vertex, f) direction of the opening of the parabola from the given graph of a quadratic function.	M9AL-Ih-i-13.2	2	
	14. Analyzes the effects of changing the values of a, h, and k of a quadratic function and its graph.	M9AL-Ii-14	3	
	15. Determines the equations of a quadratic function given: (a) a table of values (b) graph, and (c) zeros.	M9AL-Ij-15.0		

	15.1 determines the equations of a quadratic function given: (a) a table of values	M9AL-Ij-15.1	2	
	15.2 determines the equations of a quadratic function given: (b) graph, and (c) zeros.	M9AL-Ij-15.2	2	
	16. Solves problems involving quadratic functions.	M9AL-Ik-16	3	
QUARTERLY TEST			2	
TOTAL NUMBER OF DAYS			**45**	
Grade 9 -SECOND QUARTER				
PERFORMANCE STANDARDS	The learner is able to formulate and solve accurately problems involving radicals.			
CONTENT STANDARDS	The learner demonstrates understanding of key concepts of variation and radicals.			
Content Areas/Strand	**Patterns and Algebra**			
	LEARNING COMPETENCIES	**CODE**	**NO. OF DAYS TAUGHT**	**REMARKS**
	17. Illustrates situations that involves the following variations: (a) direct; (b) inverse; (c) joint; (d) combined.	M9AL-IIa-17.0		
	17.1 illustrates situations that involves the following variations: (a) direct; (b) inverse; and	M9AL-IIa-17.1	2	
	17.2 illustrates situations that involves the following variations: (c) joint; (d) combined.	M9AL-IIa-17.2	2	

	18. Translates into variation statement a relationship between two quantities given by: (a) table of values; (b) mathematical equation; (c) a graph, and vice versa.	M9AL-IIb-18.0		
	18.1 translates into variation statement a relationship between two quantities given by: (a) table of values; (b) mathematical equation; (c) a graph, and vice versa.	M9AL-IIb-18.1	2	
	18.2 sets table of values and construct a graph of a given variation statement between two quantities .	M9AL-IIb-18.2	2	
	19. Solves problems involving variations.	**M9AL-IIc-19.0**		
	19.1 solves problems that involves the following variations: (a) direct; (b) inverse; and	M9AL-IIc-19.1	3	
	19.2 solves problems that involves the following variations: (c) joint; (d) combined.	M9AL-IIc-d-19.2	3	2
	20. Applies the laws involving positive integral exponents to zero and negative integral exponents.	M9AL-IId-e-20	3	1
	21. Illustrates expressions with rational exponents.	M9AL-IIe-21	2	
	22. Simplifies expressions witth rational exponents	M9AL-IIe-f-22	4	3
	23. Writes expressions with rational exponents as radicals a	M9AL-IIf-23	2	1
	24. Derives the laws of radicals from the laws of rational exponents.	M9AL-IIg-24	2	
	25. Simplifies radical expressions using the laws of radicals	M9AL-IIg-h-25	4	2

	26. Performs operations on radical expressions.	M9AL-IIh-i-26	4	2
	27. Solves equations involving radical expressions.	M9AL-IIi-j--27	4	2
	28. Solves problems involving radicals.	M9AL-IIj-28	4	
QUARTERLY TEST			2	
TOTAL NUMBER OF DAYS			**45**	
Grade 9 - THIRD QUARTER				
PERFORMANCE STANDARDS	The learner is able to investigate, analyze, and solve problems involving quadrilaterals (parallelogram, trapezoids, kites) and trianglesimilarity through appropriate and accurate representation			
CONTENT STANDARDS	The learner demonstrates understanding of key concepts of quadrilaterals (parallelogram, trapezoids, kites) and triangle similarity.			
Content Areas/Strand	**Geometry**			
	LEARNING COMPETENCIES	**CODE**	**NO. OF DAYS TAUGHT**	**REMARKS**
	29. Identifies quadrilaterals that are parallelogram.	M9GE-IIIa-29	1	
	30. Determines the conditions that guarantee a quadrilateral a parallelogram.	M9GE-IIIa-30	1	
	31. Uses properties to find measures of angles, sides and other quantities involving parallelograms.	M9GE-IIIa-31.0		
	31.1 gives the different properties of a parallelogram	M9GE-IIIa-31.1	1	

	31.2 uses properties of parallelogram to find measures of angles, sides and other quantities.	M9GE-IIIa-b-31.2	4	3
	32. Proves theorems on the different kinds of parallelogram(rectangle, rhombus, square).	M9GE-IIIb-32.0		
	32.1 proves theorems on the different kinds of parallelogram(rectangle and rhombus).	M9GE-IIIb-c-32.1	2	1
	32.2 proves theorems on the different kinds of parallelogram(rhombus and square).	M9GE-IIIc-32.2	2	
	33. Proves the Midline Theorem	M9GE-IIIc-33.0		
	33.1 writes the proof for the Midline Theorem	M9GE-IIIc-33.1	1	
	33.2 solves problems involving Midline Theorem	M9GE-IIId-33.2	2	
	34. Proves theorems on trapezoids and kites.	M9GE-IIId-e-2	3	1
	35. Solve problems involving parallelograms, trapezoids and kites.	M9GE-IIIe-35.0		
	35.1 solves routine problems involving parallelograms, trapezoids and kites	M9GE-IIIe-35.1	2	
	35.2 creates and Solves non-routine problems involving parallelograms, trapezoids and kites	M9GE-IIIe-f-35.2	2	
	36. Describes a proportion	M9GE-IIIf-36	1	
	37. Applies the fundamental theorems of proportionality to solve problems involving proportions.	M9GE-IIIf-37.0		

	37.1 state and illustrates the fundamental theorems of proportionality and	M9GE-IIIf-37.1	1	
	37. 2 solves problems involving proportions applying the fundamental theorems of proportionality	M9GE-IIIf-g-37.2	3	
	38. Illustrates similarity of figures.	M9GE-IIIg-38	1	
	39. Proves the conditions for similarity of triangles. ***	M9GE-IIIg-39.0		
	39.1 proves SSS similarity theorem	M9GE-IIIg-39.1	1	
	39.2 proves SAS similarity theorem	M9GE-IIIh-39.2	1	
	39.3 proves AA similarity theorem	M9GE-IIIh-39.3	1	
	39.4 proves right triangle similarity theorem	M9GE-IIIh-39.4	1	
	39.5 proves special right triangle theorems	M9GE-IIIh-i-39.5	2	
	40. Applies the theorems to show that given triangles are similar.	M9GE-IIIi-40	2	
	41. Proves the Pythagorean Theorem			
	41.1 writes the proof of Pythagorean Theorem	M9GE-IIIi-41.1	1	
	41.2 solves problems applying Pythagorean Theorem	M9GE-IIIj-41.2	2	
	42. Solves problems that involve triangle similarity and right triangle.***	M9GE-IIIj-k-42.1		
	42.1 solves problems that involved traingle similarity and right triangle	M9GE-IIIj-k-42.1	3	

	42.2 creates problems that involed trianlge similarity and right triangle	M9GE-IIIk-42.2	2	
QUARTERLY TEST			**2**	
TOTAL NUMBER OF DAYS			**45**	
Grade 9 - FOURTH QUARTER				
PERFORMANCE STANDARDS	The learner is able to apply the concepts of trigonometric ratios to formulate and solve real-life problems with precision and accuracy.			
CONTENT STANDARDS	The learner demonstrates understanding of the basic concepts of trigonometry.			
Content Areas/Strand	**Geometry**			
	LEARNING COMPETENCIES	**CODE**	**NO. OF DAYS TAUGHT**	**REMARKS**
	43. Illustrates the six trigonometric ratios: sine, cosine, tangent, secant, cosecant, and cotangent.			
	43.1 illustrates the six trigonometric ratios: sine, cosine and tangent.	M9GE-IVa-43.1	2	
	43.2 illustrates the six trigonometric ratios: secant, cosecant, and cotangent.	M9GE-IVa-43.2	2	
	44. Finds the trigonometric ratios of special angles.			
	44.1 finds the trigonometric ratios of special angles.	M9GE-IVb-2	4	
	44.2 solves problems involving trigonoetric ratios of special angels	M9GE-IVc-3	4	

	45. Illustrates angles of elevation and angles of depression.			
	45.1 solves problems involving angles of elevation and;	M9GE-IVd-45.1	4	
	45.2 solves problems involving angle of depression	M9GE-IVe-45.2	4	
	45.3 creates problems on angle of elevation and angle of depression	M9GE-IVf-45.3	2	
	46. Uses trigonometric ratios to solve real-life problems involving right triangles.* **	M9GE-IVf-g-46.0		
	46.1 uses trigonometric ratios to solve real-life problems involving right triangles	M9GE-IVf-g-46.1	4	
	46.2 uses trigonometric ratios to create real-life problems involving right triangles.	M9GE-IVg-h-46.2	4	
	47. Illustrates laws of sines and cosines	M9GE-IVh-47.0		
	47.1 illustrates laws of sines and cosines	M9GE-IVh-47.1	2	
	47.2 solves problems applying laws of sines and cosines	M9GE-IVi-j-47.2	5	
	48. Solves problems involving oblique triangles.			
	48.1 solves problems involving oblique triangles.	M9GE-IVj-48.1	3	
	48.2 creates problems involving oblique triangles	M9GE-IVk-48.2	3	
QUARTERLY TEST			2	
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