

Appendix (5)

The mathematical content Analysis of mathematics curriculum for the **first grade** in light of the standards of content among the sub-periods of development.

Standards / Periods	The first period (1964 – 1972)	The second period (1972 – 1987)	The third period (1987 – 1999)
Number and Operations	<ul style="list-style-type: none"> - Reading and writing natural numbers from 1 to 20. - Figures of numbers and ordered numeration. - The concepts of addition and subtraction within 20. - Using facts of addition and subtraction within 20 to solve mathematical problems. - Using illustrative figures for numerating and arithmetic Operations. 	<ul style="list-style-type: none"> - Set – one to one corresponding - greater that (!) ,and less than () - equivalent and non equivalent sets, - The concept and sign of addition and subtraction (+), (-) and sign = - Facts of addition and subtraction within 99. - Adding and subtracting two digits of numbers without carrying and without borrowing . - Place value and the base-ten number system. - Connect number word and numerals to the quantities they represent. - Concepts of the fractions: half (1/2) and quarter (1/4) and representing. 	<ul style="list-style-type: none"> - Concept of the number reading, writing and counting. - Connect number word and numerals to the quantities they represent. - The place values of numbers 11 to 99. - Ordering numbers up to 99. - Facts of addition and subtraction within 18 by carrying and borrowing. - facts of addition and subtraction without carrying and borrowing within 99. - The concept and sign of addition and subtraction (+), (-) and sign = . - Comparing numbers by using greater(!) and smaller relations(). - Concept of Fractions: $\frac{1}{2}$, $\frac{1}{4}$ without writing.
Algebra	-----	<ul style="list-style-type: none"> - The Commutative property on addition 	<ul style="list-style-type: none"> - facts of addition and commutative property. - Ordering numbers (0 to 9) through objects by size.
Geometry	-----	<ul style="list-style-type: none"> - Name and Recognize : triangle, square, rectangle and circle shapes. 	<ul style="list-style-type: none"> - Recognizing and naming the shapes of the: Sphere, rectangular solid, rectangle and circle.
Measurement	<ul style="list-style-type: none"> - Identifying measurement units: money, weight, time and length. 	<ul style="list-style-type: none"> - Money : dinar and pence - Foot and span. - Week days Volume : cup and glass 	<ul style="list-style-type: none"> - Length : using non standards units to measure some lengths. - Time : day as a unit of time, and week days.
Data Analysis and Probability	-----	-----	-----

The content of the first column is listed in appendix (10) “Principles and Standards of NCTM” (NCTM, 2000).

The mathematical Content Analysis of mathematics curriculum for the **Second grade** in light of the standards of content among the sub-periods of development

Standards / Periods	The first period (1964 – 1972)	The second period (1972 – 1987)	The third period (1987 – 1999)
Number and Operations	<ul style="list-style-type: none"> - Natural numbers: reading and writing natural numbers within 100. - Figures of numbers within 100. - Recognizing the significance of +, -, =. - Facts of addition and subtraction within 100. - The concepts of multiplication and division within 50. - Using rules of multiplication to solve mathematical and practical problems. - Using illustrative figures to realize the idea of fractions. 	<ul style="list-style-type: none"> - The concepts of numbers from 0 to 999: reading, counting and writing. - Place value and the base-ten number system. - Adding and subtracting two digits of numbers without carrying and without borrowing . - Adding numbers horizontally and vertically within 999 by carrying . - Subtracting numbers horizontally and vertically within 999 by borrowing . - Facts of addition and subtraction within 999. - Connect number word and numerals to the quantities they represent. - the concept and sign of multiplication as a process repeated of addition. - fact of multiplication within 50 - properties of the 0 and 1 in multiplication operation - Division as opposite operation of multiplication - concepts of Fractions: $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$ reading and writing and representing. 	<ul style="list-style-type: none"> - Reviewing The concepts of numbers up to 99: reading, counting, writing and ordering. - Reading, counting and writing numbers with three digits up to 999 - Place value of numbers within 999. - Analyzing numbers of three digits to component as a combination and finding the place value for numbers (units, tens and hundreds). - The concepts of addition and subtraction within 999. - Facts of addition within 999 by carrying. - Facts of subtraction within 999 by borrowing. - Solving problems with one step on addition and subtraction. - the concept and sign of multiplication as a process repeated of addition. - Concept of Multiplication as repeating of addition - Commutative property through numerical examples - fact of multiplication within 25 - Solving problems with one step on facts of multiplication. - Concept and sign of division . - Concept of division as divided the sets to equivalent parts. - Facts of division operation within 25. - The relation between multiplication and division. - Solving problems with one step on Division. - concepts of Fractions: $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{2}{3}$, $\frac{2}{4}$, $\frac{3}{4}$ reading and writing.

Algebra	-----	<ul style="list-style-type: none"> - concepts of even and odd numbers within 10. - the summation of two even numbers is again an even number - the summation of two odd numbers is an even number - The Commutative property on multiplication. 	- concepts of Even and odd numbers within 20.
Geometry	-----	<ul style="list-style-type: none"> - concepts of the square and rectangle - constructing the geometrical shapes by cutting. 	<ul style="list-style-type: none"> - to recognize on the concepts and shape of the cylinder, cone and cube - to recognize on the concepts and shape of triangle and square - symmetrical the geometrical shapes experimentally .
Measurement	<ul style="list-style-type: none"> - Using measurement units to solve mathematical problems. 	<ul style="list-style-type: none"> - Money : dinar and half, and quarter - Time :Reading the hours - Week days, and months - Length : meter 	<ul style="list-style-type: none"> - To recognize on the meter and centimeter - Money: dinar, half and quarter . - Month as unit of time, and relations with year and seasons. - O'clock: reading in half and quarter.
Data Analysis and Probability	-----	-----	-----

The mathematical Content Analysis of mathematics curriculum for **the third grade** in light of the standards of content among the sub-periods of development

Standards / Periods	The first period (1964 – 1972)	The second period (1972 – 1987)	The third period (1987 – 1999)
Number and Operations	<ul style="list-style-type: none"> - Reading and writing natural numbers within 1000. - Decimal representation in base 10. - Facts of addition and subtraction within 1000. - Multiplication and division within 1000. - Multiplying numbers by multiples of ten. - Dividing numbers within 1000 by multiples of ten. - Using the facts of operations on numbers to solve mathematical and practical problems. - Understanding the concepts of fractions using objects representations. 	<ul style="list-style-type: none"> - concepts of Numbers within 9999 reading, writing, ordering and counting. - the place values of numbers to the base-ten system. - Facts of Adding numbers within (9999). - Facts of Subtracting numbers within (9999). - Concept and properties of multiplication and Division operations - Facts of multiplication up to 5×10 - Facts of division up to 5×10 - Facts of multiplication within 100 - Facts of division within 100 - Division as opposite operation of multiplication 	<ul style="list-style-type: none"> - Reviewing numbers within 999: reading , writing, comparing and ordering. - the place values of numbers to the base-ten system. - Numbers: Reading, writing, comparing and ordering within 9999 using the symbols()and(!) . - Facts of Adding numbers within (9999). - Facts of Subtracting numbers within (9999) - Solving application problems using the fundamental operations within (9999). - Counting using multiple of numbers up to ten times.

	<ul style="list-style-type: none"> - Reading and writing and comparing fractions $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$ $\frac{1}{5}$. 	<ul style="list-style-type: none"> - Numbers Multiplication with multiples of ten within 100 - Multiplication of two –digit number by a two-digit number with and without carrying. - Dividing two or three-digit number by one-digit number (with and without remainder). - Numbers Division with multiples of ten within 100. - The concepts of common fractions - reading and writing common fractions with denominator less than or equals 8 , - equivalent fractions . 	<ul style="list-style-type: none"> - Facts of multiplication tables up to 10×10 - Division as opposite operation of multiplication - Concept ,Mechanism and procedures of Division operation. - Multiplication and division of two –digit number by one-digit number. - Multiplication of two –digit number by a two-digit number - Dividing even numbers of two digits on number 2 and 3. - Reviewing fractions: $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{3}$, $\frac{2}{3}$, - Fractions with denominators 6 - Fractions with denominators 8 - Fractions with denominators up to 10.
Algebra	-----	-----	<ul style="list-style-type: none"> - Commutative property on numbers multiplication.
Geometry	<ul style="list-style-type: none"> - Recognizing on the shapes of circle, half circle, square and rectangle. 	<ul style="list-style-type: none"> - Concepts : point, line, segment, ray, kinds of angles(right, acute, obtuse), kinds of triangles, quadrilateral parallelogram, rectangle, square, parallel lines, - the right angle as a unit to find the sum of the angles of a triangle and quadrilateral figures - Categorize the geometrical figures in light of the properties of shapes. 	<ul style="list-style-type: none"> - Concepts : point, line, segment - Drawing the segment - Properties of triangles, rectangle, square an drawing the shapes.
Measurement	<ul style="list-style-type: none"> - Recognizing the relationships between measurement units: - Money : dinar and half, and quarter - Time : period of lesson started, and lunch. - Week days, and months - Length : meter - Using the relationships between measurement units to solve mathematical problems. 	<ul style="list-style-type: none"> - Wight: kg, half kg and gram - Money : dinar and fells - Time : year, month, week, hour and parts - Length : meter, cm, mm and km - Relation ships between the units. 	<p>Measurement units of :</p> <ul style="list-style-type: none"> - Wight: kg and relation with gram - Money : relations between units of Dinar. - Time : reading the time (hours). - Length :kilometer, cm, mm - Relation between km and the units - Using non standards measurements - Application problems.
Data Analysis and Probability	-----	-----	-----

The mathematical Content Analysis of mathematics curriculum for the **Fourth grade** in light of the standards of content among the sub-periods of development.

Standards / Periods	The first period (1964 – 1972)	The second period (1972 – 1987)	The third period (1987 – 1999)
Number and Operations	<ul style="list-style-type: none"> - Reading and writing numbers up to 10,000. - Developing reading and writing numbers up to a million. - Using facts of the fundamental operations within million. - The concepts of common fractions, reading and writing fractions and mixed numbers (fraction and number). - Addition and subtraction of common fractions. - Converting mixed numbers into fractions and vice versa. - Decimal fractions: the concepts of decimal fraction: the concepts decimal fraction writing decimal fractions up to three decimal places. - Addition and subtraction within three decimal places. 	<ul style="list-style-type: none"> - Numbers up to 7 digits: reading and writing. - Place value of Numbers consisting seven digits. - Addition and subtraction of numbers with (10 000) horizontally and vertically. - Multiplication of numbers with seven digits at most. - Division of a number within seven digits by a number of two or three digits. - Reducing Fractions using common factors. - Concept and Applying divisibility by 2 , 3, and 5 to reduce fractions. - Concepts of common Fractions, equivalent fractions, fractions of equal denominator - addition and subtraction of identical common fractions. - addition and subtraction of common fractions with common denominator less than or equals 24. - The concept of decimal fraction, writing decimal fractions of three decimal places. - Addition and subtraction of decimal fractions. - Converting decimal fractions into common fractions. 	<ul style="list-style-type: none"> - Numbers up to 7 digits: reading and writing. - Place value of Numbers consisting seven digits. - Adding and Subtracting numbers within seven digits. - Numbers multiplication by 10 and 100 - Multiplication of numbers with three digits at most. - Division of a number within five digits at most on a number of one or two digits. - Solving application problems includes fundamental operations with two steps at most. - Using strategies to estimate the results on numbers computations and to judge validity of such results through solving the problems. - Concepts of common Fractions, equivalent fractions, fractions of equal denominator, and comparing fractions. - addition and subtraction of common fractions with equal denominators. - addition and subtraction of common fractions with multiple denominators within 24. - Concept of decimal fraction with two decimal digits at most. - Comparing two decimal fractions. - Addition and subtraction decimal fractions within two decimal digits.
Algebra	-----	<ul style="list-style-type: none"> - Even and odd numbers. - Factors and number multiples. - founding the greatest and the lower common divisor of two numbers or more than. 	<ul style="list-style-type: none"> - Open statements includes comparing between numbers. - Open statements includes fundamental operations. - Numbers Multiples and Divisibility within 100 on 2, 3 and 5 - Even and odd numbers.

			- speed and measured by unit km/h.
Geometry	<ul style="list-style-type: none"> - Drawing lines and elementary geometric figures (the square and rectangle) using the ruler and graph paper. 	<ul style="list-style-type: none"> - Concepts of: line, line segment, ray, angle, types of angles (right, acute, obtuse), right-angle triangle, quadrilateral parallelogram, rectangle, square, parallel lines, - the right angle as a unit to find the sum of the angles of a triangle and quadrilateral figures. - Drawing square and rectangle shapes - The concepts of area and perimeter for square and rectangle - calculating the area and perimeter of geometrical figures - the generalization related to the relation between the lines and angles. - Properties of square , rectangle and parallelogram 	<ul style="list-style-type: none"> - Concepts of: angle and ray. - Types of angles (right, acute, obtuse), and right-angle as a measuring unit. - Triangle types with related to the angles and sides. - Solids : parallelogram, and cube - rectangle, square, parallel lines,
Measurement	<ul style="list-style-type: none"> - Using units of measurement (length, money, and weight units) to solve practical problems involving decimal fractions. - Reading the time (hour) within quarter and third of hour. 	<ul style="list-style-type: none"> - units of Meter and relations between parts. - money , dinar and his parts as introduction to concept of decimal fraction. 	<ul style="list-style-type: none"> - Reviewing to units of meter (dcm, cm). - Using (mm) in measuring the length of segments. - Measuring perimeter of triangle, square, and rectangle to one mm accuracy nearly . - Comparing between areas by using non standards units. - Converting between metric units of length: (km, m, cm and mm).
Data Analysis and Probability			

The mathematical content Analysis of mathematics curriculum for the **Fifth grade** in light of the standards of content among the sub-periods of development.

Standards / Periods	The first period (1964 – 1972)	The second period (1972 – 1987)	The third period (1987 – 1999)
Number and Operations	<p>Numbers:</p> <ul style="list-style-type: none"> - divisibility by 2,3,5,9 and 10. - Prime number: prime numbers up to 100. <p>Factors of the numbers.</p> <ul style="list-style-type: none"> - Factorization of numbers: writing numbers (up to 100) as products of prime numbers. - The concepts of multiples, the common factors, the least common multiple. - Using factorization to find out the common multiple of numbers. <p>Common fractions:</p> <ul style="list-style-type: none"> - concept of Common fractions: and reduction fractions, - addition common fractions using the method of the least common denominator. - subtraction common fractions using the method of the least common denominator. - Multiplying common fractions with integer. - Multiplying two common fractions. - Division of integer number on common fractions. - Division of common fractions on integer number. - Dividing two common fractions. - Solving problems involving common fractions. <p>Decimal fractions:</p> <ul style="list-style-type: none"> - the concept of decimal fractions, converting decimal fractions into common fractions. - Multiplication decimal fractions by multiples of ten. - Division of decimal fractions on multiples of ten. 	<ul style="list-style-type: none"> - Concepts of Natural numbers up to $(10)^9$. - reading, writing and ordering numbers. - The four fundamental arithmetic operations on natural numbers. - Division of number by divisors consisting of more than two digits. - Concepts of Common fractions, equivalent fractions, ordering of common fractions. - The four fundamental arithmetic operations on common fractions. - Concept of decimal fractions, periodic fraction - decimal fractions: reading and writing decimal fractions, - Approximation to one digit - the four fundamental arithmetic operations on decimal fractions. - Converting common fractions into decimal fractions and vice versa. <p>Solving problems on numbers, fractions and Checking the validity of solutions for problems involving the four fundamental operations.</p> <ul style="list-style-type: none"> - Divisibility by 4, 6, 9 and 10. - Numbers factorizing. - The greatest common divisor of two or three numbers - the least common multiple, of two or three numbers. 	<ul style="list-style-type: none"> - Numbers within 9 digits at most. - The place value of numbers within 9 digits. - Reading writing, comparing and Ordering Numbers within 9 digits. - Addition and subtraction numbers within 9 digits. - Numbers multiplication and division by Multiple of ten (10, 100, and 1000). - Multiplication and division of numbers within 9 digits. - Solving Application problems by using Approximation and rounding numbers and estimation to check the validity of results. - Divisibility by 2, 3, 5, and 10, . - Common multiple and divisor. - prime numbers, and factorizing numbers . - The least common multiple for two or three numbers within three digits - the greatest common divisor for two or three numbers within three digits. - Multiplying and dividing fraction with integer number. - Rounding over of fraction - Multiplying and dividing two fraction. - concept of :Decimal fraction up to four digits place, reading ,writing equivalent fractions, comparing and reducing fractions . - Decimal fractions Addition and Subtraction. - Decimal fractions multiplication and division. - Multiplying and Dividing decimals fraction by: 10, 100, and 1000. - Converting decimal fractions to common fraction.

			<ul style="list-style-type: none"> - Application problems on fundamental operations number and fractions.
Algebra	-----	<ul style="list-style-type: none"> - Commutative , associate and distribution properties. 	<ul style="list-style-type: none"> - Open sentences containing the four operations on fractions.
Geometry	<ul style="list-style-type: none"> - The straight line, measuring the straight line practically, bisect the straight line by means of measurement. - Using geometry tools to draw geometric figures and use measurements to compare them. - The concept of angles. - Drawing elementary geometric figures: circles, square, and rectangle using geometry tools . - Triangle: six elements, types related to the sides and angles. - Drawing the triangle if given: three sides, or two sides and angle , or two angles and one side. 	<ul style="list-style-type: none"> - Concepts of: Angles, measuring angles. Line segment, parallel and perpendicular lines. - Drawing lines , triangle , square, rectangle and parallelogram Using ruler, protractor and compasses, - properties of the parallelogram. - Circles parts of circle: center, diameter, radius and chord. - Identifying the dimensions of cube and rectangular solid - finding their volume and total surface area of cube. - Relation and laws of finding the areas of given geometrical figures: square, rectangle and parallelogram. - Solve practical problems on areas of geometrical figures 	<ul style="list-style-type: none"> - Angle: measuring and types. - Sum of triangle angles, and sum of angles measures around point - Draw triangle if two angles and side given, and if given angle lies between two sides. - Lines : parallel, perpendicular, and intersection. - Drawing parallel and perpendicular lines. - the relations between angles measurements : neighboring, Corresponding and vertically opposite in the parallelism case - Drawing the square , rectangle. - Systematic ,non systematic shapes and hexagons. - the circle: center , diameter , arc and cord .
Measurement	<p>Areas:</p> <ul style="list-style-type: none"> - the concept of area according the geometrical shapes through counting the numbers of squares. - metric system of area: m^2 , cm^2, donm(1000 m^2). - Using geometric formulas to find the areas of square and rectangle.. <p>Volumes:</p> <ul style="list-style-type: none"> - the concept of volume and amplitude, metric system of volume: m^3, cm^3. - Calculating the volumes of rectangular solid and cube. 	<ul style="list-style-type: none"> - Concepts of area, surface area, total area, and using square unit and relations among units as a measurements units of area. 	<ul style="list-style-type: none"> - Perimeter each of rectangular and regular shapes. - the relations between metric units of areas: (m^2, cm^2, and dm^2). - Rectangle and square areas. - Speed :m/sec , m/min. - Application problems.
Data Analysis and Probability	-----	-----	-----

The mathematical content Analysis of mathematics curriculum for the **sixth grade** in light of the standards of content among the sub-periods of development.

Standards / Periods	The first period (1964 – 1972)	The second period (1972 – 1987)	The third period (1987 – 1999)
Number and Operations	<ul style="list-style-type: none"> - Calculating the Arithmetic average of numbers, - squares of numbers up to 10. - finding out the square roots of numbers by means of factorization. Proportion. - the meaning of proportion, percentage, - converting, percentages into common and decimal fractions. - Simple profit, proportional division - Solving application problems simple profit and proportional. 	<ul style="list-style-type: none"> - Concept of solving problem - Steps of solving problems - Analyzing the problems, identified the known and unknown data - Plan of solution. - Checking the validity of solution - Concepts of : Factors and multiples of number, square and cubic root,. - Number square and cube (1 to 5) - finding the square roots and cube roots of numbers - Factorization of number and writing it as a product of prime numbers - Numbers analyzing to the factors - approximating numbers to three decimal places - Concepts of: Ratio, percentage, simple and compound profit, tax, proportional - Using properties of Proportion in solving problems, - Changing the ratio to the percentage - Arithmetic average, and rates related to time - Daily problems involving saving, banking, taxes and discount. - Using concept of scale in minimize and maximize. 	<ul style="list-style-type: none"> - Numbers within 10 digits at most. - Facts of Addition, subtraction Multiplication and division within 9 digits. - Numbers multiplication and Division by Multiple of ten (10, 100, and 1000). - Numbers division on numbers of three digits at most. - Approximation and rounding numbers within 9 digits. - Numbers Square and cubic, Square and Cubic root for numbers of perfect square and Cubic. - Common multiple and divisor, prime numbers, and factorizing numbers . - The least common multiple and the greatest common divisor for two or three numbers within three digits. - concept of fraction, equivalent, reducing, comparing - facts of addition and subtraction on fractions. - multiplying and dividing fraction with integer. - Decimal, and common fractions Addition and subtraction. - Decimal and common fractions multiplication and division. - Converting decimal fractions to common fraction. - Approximation and Turning decimal fractions to one or two place value. - Ratio, .Percentage, and Proportion . - Simple profit, and lost. - Taxes and almsgiving. - Application problems on the basic operations on numbers and ratio, and fractions.

Algebra	-----	-----	<ul style="list-style-type: none"> - Using symbols. - Simple expressions and substitution. - Solving equation with one variable includes one of the basic operations. - Application problems by using symbols on the basic operations. - Open sentences containing the four operations on fractions.
Geometry	<ul style="list-style-type: none"> - Revision of drawing a triangle with given properties. - Drawing circles and calculating their circumferences and areas, - drawing quadrangles. - The map scale, finding out the actual distance between two points on a map. 	<ul style="list-style-type: none"> - Concepts of: square, rectangle and parallelogram, triangle, trapezoid, right cylinder, cube, circle area, The volume and units. - Using the relations to find the area and volume of figures - Areas of square, rectangle and parallelogram. - Areas of triangle, trapezoid and rhombus. - Circle circumference, and area of circle. - Regular polygons (triangle, square, hexagon, octagon), - surface and total surface areas of cube and rectangular solid. - Volumes of cube and rectangular solid. - Volumes and total surface areas of right cylinder. 	<ul style="list-style-type: none"> - Angle: measuring and types. - Sum of triangle angles, and sum of angles measures around point - Draw triangle if two angles and side given, and if given angle lies between two sides. - Lines : parallel, perpendicular, and intersection. - Drawing parallel and perpendicular lines. - the relations between angles measurements : neighboring, Corresponding and vertically opposite in the parallelism case - Drawing the square , rectangle. - Systematic ,non systematic shapes and hexagons. - the circle: center , diameter , arc and cord . - The quadruple shapes s and summation of angles. - Properties of quadruple related to sides , angles, and diameters. - Drawing triangle if given three sides. - Drawing parallelogram if given angle lies between two neighbor sides. - Drawing parallelogram if given two neighbor sides one diameter. - Circle and surroundings. - Drawing regular shapes inside circle as square, rectangular.
Measurement	-----	<ul style="list-style-type: none"> - Length units: Meter (multiples and part). - Area units: square meter (multiples and part). 	<ul style="list-style-type: none"> - Reviewing the metric units of length - Metric units for areas.

		<ul style="list-style-type: none"> - Volume units: Cubic meter: multiples and parts of cubic meter. - Relations between units and parts and multiples - Using units of measurements in solving problem on area and volume and length. 	<ul style="list-style-type: none"> - Metric units for volume. - Liter and Mel liter to measuring the capacity. - Mass units (ton as a unit). - Temperature units. - Adding and subtraction measurement units. - Areas of: triangle, parallelogram, and Rhombus. - Total area of cubic and rectangular solid. - The pyramid and the prism - Cubic volume and prism. - Application problems involving rates and derived measurements.
Data Analysis and Probability	<ul style="list-style-type: none"> - Concept of Arithmetic average, and finding for a set of numbers. - Interpreting and Representing data by diagrams: bar graphs and charts. 	<ul style="list-style-type: none"> - Computing the average for a set of values. 	<ul style="list-style-type: none"> - Representing the qualitative data by tables ,pictures, and lines. - representing qualitative data using frequency tables - calculating the mean and range to a set of numbers. - Application problem.

The mathematical content Analysis of mathematics curriculum for the **seventh grade** in light of the standards of content among the sub-periods of development.

Standards / Periods	The first period (1964 – 1972)	The second period (1972 – 1987)	The third period (1987 – 1999)
Number and Operations	<ul style="list-style-type: none"> - Revision: divisibility factorization, power, finding out the square roots of numbers by means of factorization, - the concepts of the greatest common divisor and the least common multiple, - finding out the greatest common divisor and the least common multiple by means of factorization. - Common fractions; operations on common fractions. - Decimal fractions and approximation: arithmetic operations on decimal fractions. - converting fractions and representing them 	<ul style="list-style-type: none"> - Concepts of: integer number, commutative, closed and association, open set, equation, solution set, substitution set, inequality, negative number, integers set , unique element. - Generalizations related to the relation between integers numbers. - Basic operation on integers numbers and their properties - Concepts of: fraction, equivalent fractions, rational number, periodic decimal fraction, finite and infinite decimal fractions, and set of rational numbers. - operations and their properties on set of rational 	<ul style="list-style-type: none"> - Concepts of Integer numbers(positive and negative), Exponents, Absolute value of negative numbers, and Integer numbers comparing. - Facts of addition, subtraction, multiplication and division on Integer numbers. - concept of Rational number and inverse and comparing. - Facts of addition, subtraction, multiplication and division on Rational numbers. - Numbers factorizing, and Square root . - Common factors : least multiple and greatest divisor.

	<p>in different forms.</p> <ul style="list-style-type: none"> - Approximating numbers, solving different problems concerning the four basic operations of arithmetic. 	<p>numbers.</p> <ul style="list-style-type: none"> - Write the rational numbers in simple form - Convert the infinite periodic decimal fractions to finite fraction - Convert the rational numbers to decimal fractions 	<ul style="list-style-type: none"> - Concept of proportion, Direct and inverse proportion. - Laws of proportion. - Real life Applications on proportion.
Algebra	<ul style="list-style-type: none"> - Symbols and algebraic terms, factors of algebraic terms, calculating the numerical value of an algebraic expression. - The four fundamental operations of arithmetic on algebraic expressions, - reducing common algebraic fractions. - Simple algebraic equations and how to solve them. 	<ul style="list-style-type: none"> - Concept and symbol of Set, elements of set, union and intersection, empty set, subset, distinct sets, - concept of equal two sets, and symbols related to these concepts, - Venn diagrams, - Concept of : algebraic term, algebraic expressions, factors analysis, common factors, numbers power, set of odd and even numbers - Using symbols to write algebraic expressions, - factorizing algebraic expressions by means of common factors or collecting terms, - addition and subtraction of algebraic terms, - factorizing algebraic expressions as product of prime factors, - expressing by means of exponent, - using distribution law in algebraic expressions. - algebraic expressions cancellation - Concept and symbols of: Open sentences, cancellation rules . - Solve simple Equations of the 1st degree. - Solve simple inequalities of the 1st degree - Using properties of inequalities in solving - Solve real life problems on inequalities and Equations 	<ul style="list-style-type: none"> - Set and elements, Sub-set and equal sets. - Union , intersection and subtraction of sets. - The whole set and complementary. - Properties of operations on sets. - De Morgan laws. - Algebraic expression and terms. - Finding the value of algebraic expression by substitution. - Algebraic expression addition and subtraction. - Simple algebraic expression multiplication. - Factorizing algebraic expressions by common factor. - Open statement, set of substitution, and solution set. - Solving linear equation with one variable. - Application problems includes temperature degree.
Geometry	<ul style="list-style-type: none"> - Angles: recognizing the types of angles and the relationships between them. - Parallel lines and the relationships between the resultant angles. - Geometric theories concerning the angles of 	<ul style="list-style-type: none"> - Concepts and symbols of: Angles, types of angles. Line, ray, segment, parallel and perpendicular lines. - Relations related to lines and angles. - Summation of triangle angles. 	<ul style="list-style-type: none"> - Parallel and intersection lines, and relation between angles measures. - Summation of angles measures of closed polygon . - Cases of triangles Congruency.

	<p>the triangle and polygon.</p> <ul style="list-style-type: none"> - Proving theories using congruent triangles. - constructional geometry: using geometry tools to transfer a given angle, - to draw line parallel to a given a line, - bisect a given angle and draw a line perpendicular to a given line from a point on the line or from a point outside the line, how to use the proof. 	<ul style="list-style-type: none"> - Drawing parallel lines using the ruler and triangle. - Concept of : curve, closed curve, simple closed curve, concave, area, symmetry shapes, units of area, parallelogram and other geometrical figures. - Drawing the geometrical figures - Properties the concept of area, areas of rectangle, triangle, parallelogram, - using the general relation of geometric figures to determined the areas. - Concept of Pythagoras theorem, - Solving problems by using Pythagoras theorem - Concept of : solid, properties of solids, volume and surface areas of solids, - Using Properties relations to explain the figures of solids, cube, rectangular solid, right pyramid, right prism - Solving problems by using laws of volume for figures - Solving real life problems on volumes of figures. 	<ul style="list-style-type: none"> - Cases of triangles similarity - Transfer of known angle. - Bisection given angle. - Constructing perpendicular line from point lies on line. - Constructing perpendicular line from a given point not lies on line. - Bisection segment.
Measurement	<ul style="list-style-type: none"> - apply and use geometric tools to draw parallel lines, transfer and bisect angles to accurately. - Draw vertical line from a point outside and lies on a given line with accuracy. 	<ul style="list-style-type: none"> - Drawing parallel lines using the ruler and triangle with level of precision - Using Properties relations to explain, and determined the volume of figures: solids, cube, rectangular solid, right pyramid, right prism. - using the general relation of geometric figures to determined the areas. 	<ul style="list-style-type: none"> - Areas of irregular shapes. - Sector area - Surface area and volume of the pyramid - Surface area and volume of the prism. - Volumes of irregular solids.
Data Analysis and Probability			<ul style="list-style-type: none"> - Data representation by sectors and frequency tables. - The mean for data grouped in frequency tables. - Random experiment (sample space)

The mathematical content Analysis of mathematics curriculum for the **Eighth grade** in light of the standards of content among the sub-periods of development.

Standards / Periods	The first period (1964 – 1972)	The second period (1972 – 1987)	The third period (1987 – 1999)
Number and Operations	<ul style="list-style-type: none"> - Finding out the square roots of numbers. 	<ul style="list-style-type: none"> - Concept of ratio, percentage, proportion: directly and inversely proportional quantities, proportional division, gain and loss, simple and compound interest, bills discount, insurance. - Concept of Real number, rational and irrational numbers, - Square root of number, numbers powers, Integer and rational exponents - Representing Intervals and kinds of intervals on line number. - decimal and approximated representation. - Operations, properties of operations, on real numbers. - Rules of integer and rational exponents on sets of numbers. - calculating roots of numbers. - Properties of binary operations: closure, commutatively, associativity, identity element, - inverse, distribution of multiplication over addition on the sets of integers and rational. - Properties of addition and multiplication of real numbers, - distribution of multiplication over addition. 	<ul style="list-style-type: none"> - Numbers : rational , irrational and real. - Calculating the Square root of numbers using the general way. - The four basic operations on real numbers. - Properties of addition and multiplication on real numbers. - Laws of Exponents and roots. - Insurance Calculating, legacy Calculating (as application on proportion and ratio). - Calculating commercial Discounts, Simple and compound profit, and Stocks market and bonds.
Algebra	<ul style="list-style-type: none"> - Solving a system of linear equation. - Using different ways of factorization to reduce algebraic expression. - The four fundamental operations of arithmetic on algebraic expressions. - algebraic fractions: arithmetic operations on algebraic fractions. - Reducing algebraic fractions and solving algebraic fractional equations. 	<ul style="list-style-type: none"> - Sets: whole set, complement of a set, isolating sets, - properties of union and intersection on sets. - De Morgan laws. - concept of relation, domain, range and image - relations expressions and graphing relations. - the concept of function, domain, range and image equal functions. 	<ul style="list-style-type: none"> - Multiplication of two expressions. - factorizing difference between two quadratic expressions. - factorizing quadratic expression. - Relations with finite domain and representation. - Function and representation - Linear function and graphing. - linear equation with two variables and

	<ul style="list-style-type: none"> - Representing points in the Cartesian plane. 	<ul style="list-style-type: none"> - The expressions and properties of relation and function - Using expressions of function and graphing functions - Using the rules of exponents to simplify the algebraic expressions. - multiplication of algebraic expression. - algebraic expression analysis: difference of two squares, sum and difference of two cubic terms, - factorizing of three-term expressions, - Solving real life problems on algebraic operations. - Concept of Systems of linear inequalities - linear equation with two variables, - solving a system of two linear equations by substitution and elimination. - Proving theorems of quadrilaterals by means of congruent triangles. - Solving real life problems on Systems of linear equations. 	<ul style="list-style-type: none"> graphing. - Solve linear equation with two variables by using : graphing, omitting way or substitution way. - Basic trigonometric ratios: sine , cosine , tangent - of right triangular - Calculating trigonometric ratios by using tables. - Calculating angle if the trigonometric ratios are known - Applications on Solving right triangle.
Geometry	<ul style="list-style-type: none"> - The concept of Pythagoras theorem. - Using Pythagoras theorem to find the solution of a right-angle triangle. - Proving geometric theories concerning the properties of isosceles triangle. - Properties of parallelogram. - The relationships between angles and sides of the triangle. - Using theories to solve and prove geometric problems. 	<ul style="list-style-type: none"> - Concept of Triangle: angles and sides of triangles - the relationships between angles and sides of triangles, - congruent and similar triangles, - solving geometrical problems using the congruent and similar triangles - intersected lines inside the triangle, - properties of isosceles triangle, equilateral triangle, right angle triangle, - concept and properties of quadrilateral, trapezoid, parallelogram, and similar figures. - Theorems and proof on the relations of geometrical figures using the congruent of triangles. 	<ul style="list-style-type: none"> - Properties of triangle types. - Properties of right triangle and Pythagoras theorem. - The relation between the triangle sides and angle - the exterior angle related to the triangle. - The segment joint the vertex and chord intermediate in the right triangle. - Cartesian multiplication for a finite set - Cartesian coordinates. - Properties of quadrilateral shapes: Parallelogram, rectangle and square. - Triangles Equivalence. - Parallelogram Equivalence. - Surface Area and volume of cone - Volume and surface area of cylinder.

			- Surface area and volume of the sphere.
Measurement	<ul style="list-style-type: none"> - Using geometry tools to draw geometric figures. - Systems of measurement: Metric system and British system of measurement: - revision of measurement units, - converting between the different units of length, area, volume, amplitude and weight. - Using units of measurement to solve mathematical and practical problems of volumes and areas. 	<ul style="list-style-type: none"> - geometric constructions using ruler and compasses, - Drawing the geometrical figures in light of their properties. 	<ul style="list-style-type: none"> - Use formulas to determined the surface area and volume of cone, cylinder and sphere.
Data Analysis and Probability	-----	-----	<ul style="list-style-type: none"> - The Stability Phenomena of frequency ratio - Sample space. - Types of events. - Using principle counting. - Proprieties of probability.

The mathematical content Analysis of mathematics curriculum for the **Ninth grade** in light of the standards of content among the sub-periods of development.

Standards / Periods	The first period (1964 – 1972)	The second period (1972 – 1987)	The third period (1987 – 1999)
Number and Operations	<ul style="list-style-type: none"> - Proportion: percentage, using percentage to solve problems, - proportional division, the gain and loss, simple interest, discount, compound interest. 	<ul style="list-style-type: none"> - Concept of order relation on the set of real numbers, - the property of order relation on real numbers. - Using the property of order relation in solving mathematical problems - Properties of addition and multiplication of real numbers, - distribution of multiplication over addition - Properties of operations on real numbers set. 	<ul style="list-style-type: none"> - Exponentials and applications on small and large numbers.
Algebra	<ul style="list-style-type: none"> - Factorization of algebraic expressions. - Factorizing the algebraic expression on the general form : $aX^2 + bX + c$. - Factorizing the difference between squares of two algebraic expressions. - Factorizing summation and difference cubic 	<ul style="list-style-type: none"> - Concept of linear statement, prime algebraic statement, similar terms, - Expressions of Algebraic fraction, concept and simplifying - Factorizing three-term algebraic expressions, by using different methods of analysis 	<ul style="list-style-type: none"> - Reviewing factorizing of quadratic expressions and difference between two squares expressions. - Analyzing expressions by square Completing. - Analyzing the summation of tow cubic expressions , and the difference between tow

	<p>of two algebraic expressions.</p> <ul style="list-style-type: none"> - Calculating the square root by means of factorization. - Reducing algebraic expression by means of factorization. - Solving practical problems by means of factorization. - Solving linear algebraic equations (degree one) and quadratic algebraic equations (degree two) by means of factorization. - sketching: providing sketches of linear functions. - Solving a system of linear equations by means of sketching. 	<ul style="list-style-type: none"> - the greatest common divisor, and multiple common least of expressions - reduction of algebraic fractions using the greatest common divisor, and least common multiple, - addition and subtraction of algebraic fractions - multiplication and division of algebraic fractions. - Concept of Linear function, Quadratic equations , quadratic function, maximum and minimum values for function - Quadratic equations: solving quadratic equations using the discriminator - Roots of quadratic functions and graphing quadratic - Roots of linear function and graphing linear function, - Properties of Linear and quadratic function - The relation between the roots of equation and zeros of functions - Solving problems on functions - The relationships between the discriminator and the graphing of quadratic functions - Concept of Inequalities - linear inequality with two variables, - graphing linear inequalities with 2 variables. - Solving a system of linear inequalities by means of graphs. - Linear programming and related practical problems. - Quadratic equations: solving quadratic equations by means of: factorization, completing the square, - the quadratic formula and graphs. - Related application, discriminator of quadratic equations, 	<p>cubic expressions.</p> <ul style="list-style-type: none"> - Reducing the Algebraic fractions. - The greatest common factor , and the least common multiple of algebraic expressions. - The four basic operations on expressions. - the Linear inequality of one variable - the Linear inequality of tow variables and their graphical presentation. - Solving system of linear inequality with tow variables graphing. - Applications problems on linear inequality with tow variables. - Linear and quadratic functions. - Solving the quadratic equation by: analysis factors, general law, and graphing. - Solving fractions equations, and application problems. - Solving Simple Trigonometric equations.
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		- the relationship between discriminator and roots of quadratic equations.	
Geometry	<ul style="list-style-type: none"> - The concept of geometrical transference, identifying transferring shapes. - Geometric theories concerning congruence and areas. - Using geometric facts to solve problems. - Pythagoras Theorem: using Pythagoras theorem to find out the solution of the right-angle triangle. - The concept of trigonometric expressions and calculating them. - Using mathematical formulas to calculate areas of geometric figures (two dimensions). - Proving geometric theories. - The concept of the circle and related theories, proving them using these theories to solve problems of geometry. 	<p>Analytic geometry: rectangular coordinates, original coordinate, mid-point</p> <ul style="list-style-type: none"> - Concept and law of the distance between two points of line segment. - Straight line: slope, forms of equation - Founding the lines equation in light of conditions - Conditions of Parallel and perpendicular lines using the concept of slope - Proof the theorems and some of the geometrical relations <p>Circle: center, radius , diameter, chords and arcs of circle,</p> <ul style="list-style-type: none"> - sector, circular segment, - angles and lines related to the circle . - the relationships between lines and angels related to circle - concept of circular quadrilaterals, solids: prism, pyramid, cylinder, cone and sphere, volumes and surface areas of solids - use the geometrical relation to find the areas and volume of solids. - Solve geometrical problems - Proof theorems related to the topics <p>Trigonometric</p> <ul style="list-style-type: none"> - Concept and symbols of trigonometric ratio, sine, cosine, and tan - using right triangle to illustrate the relationships between trigonometric ratios. - Founding the sine, cosine and tan of angles 30, 60 and 45 - The relation between the trigonometric ratio - calculating the values of trigonometric expressions 	<ul style="list-style-type: none"> - The orthogonal coordinates in plane. - The distance between two points . - coordinates of a point that bisecting a straight line - straight line: slope, equation, and parallel condition. - Geometric transformation :reflections ,symmetry, rotation, and dilatation . - The Central angles ,angles lies on the circle, relation between central angles and the angles lies on the same arc, and theorems related to their. - Theorems of circle chords. - Circles intersection. - Circle tangents and their theorems. - The circular Quadrilateral shapes and properties. - Drawing triangle in side a circle. - Drawing circle inside a triangle. - Trigonometric ratios. - The relations between the basic trigonometric ratios. - The Trigonometric ratios of the angle 30,45, 60. - Calculating trigonometric ratios for acute angle if one known. - Using tables of trigonometric ratios. - Solving the right triangle.

		<ul style="list-style-type: none"> - using tables of trigonometric ratio - solving the trigonometric equation using the generalization of trigonometric ratio - proof the trigonometric Identities - solving real life problems on the trigonometric ratios. 	
Measurement	- Solving mathematical and practical problems using units of units of money.	-----	-----
Data Analysis and Probability	-----	<ul style="list-style-type: none"> - Concept of Collecting and organizing data, representing data: pie chart, bar graph, histogram, and frequency polygon. - Reading the statistics tables and interpretation the data - Calculating the average of data Mean, - Concept of mode, and founding for data, and frequency tables - Concept and symbols of sample space, mutually exclusive events, simple events, - probability, - writing the sample space for a random experimental random - uniform probability ,and laws of uniform probability, - intersection and founding probability of the intersection of two events, - probability of complementary event. - Using laws probability in solving problems. 	<ul style="list-style-type: none"> - Representing statistical data by: frequency tables, histogram and frequency polygon. - Tendency measurements ,The mean, median and mode. - Calculating the measures of center for values given, and for frequency tables. - The shape of frequency distribution.

The mathematical content Analysis of mathematics curriculum for the **Tenth grade** in light of the standards of content among the sub-periods of development.

Standards / Periods	The first period (1964 – 1972)	The second period (1972 – 1987)	The third period (1987 – 1999)
Number and Operations	<ul style="list-style-type: none"> - Proportion: definitions of ratio, terms of the ratio. - proportionality Rules. - The ratio between areas of two triangles have the same high as the ratio between their bases. 	<ul style="list-style-type: none"> - Concept of Binary operation on sets of numbers, - Properties of Binary operation(closed, commutative, associative, unique element, inverse of element) 	-----

	<ul style="list-style-type: none"> - Numerical application on ratio and proportional. proportional division: - Definitions and theorems and numerical applications - Properties of multiplication distribution on addition operation on Natural and Rational numbers. 	<ul style="list-style-type: none"> - Concept and properties of Mathematical system with one operation - Concept and properties of Mathematical system with two operations - Concept and properties of field , order field and group - Theorems and Proofs related to these concepts mathematical systems. - Concept and properties of integers numbers. - Numerical systems: binary, octal - Writing numbers in binary and octal systems - Component of computer: input, output, arithmetic unit, control unit, central process. - Converting numbers from decimal to binary and octal - Converting numbers from binary to octal and inversely - Facts of basic operations on binary and octal systems - Subtraction operation by using the number complement in binary system. - Explain the steps of solving problems by drawing flowcharts. 	
Algebra	<ul style="list-style-type: none"> - Sets theory: concept of set, and sets symbol. elements of a set - representation by Venn Diagrams - universal set - subsets and operations on sets and their symbols. - De Morgan laws - Function: - linear functions and quadratic functions, graphing linear and quadratic functions. - Linear and quadratic equations and inequalities, solving quadratic equations using the algebraic methods. 	<ul style="list-style-type: none"> - Concept of relation and founding the Domain, range, image, - Properties of relations reflection, symmetric, transitive and equivalence relation, - Using the Properties of relations in solving problems - found the equivalence classes of a given set . - Functions, types and properties - Concept and Founding composition of two function - inverse and identity function - equality of two pairs coordinate. - tangent equation of circle at given point. 	<ul style="list-style-type: none"> - Polynomial definition. - Division operation on Polynomials. - The synthetic division method. - Remainder theorem and Polynomials zeros. - Relations and types. - Functions and types. - The four basic operations on functions. - Composition of functions. - Solving equation with one variable. - Solving a system of three linear equations. - Solving a system of equations :one is linear and the other quadratic. - Solving a system of quadratic equations

		<ul style="list-style-type: none"> - equivalence statements, open statement, - set of substitution ,set of solution, solution of open statements, 	whenas the solution end to linear equations.
Geometry	<ul style="list-style-type: none"> - circle Angles: definitions, - theorems: the relation between the central angle and the angle lies on the circle on the same arc. - The angle in front of the diameter - the relation between angles lies on the circle and have the same arc. - Numerical application on circle angles. - Definitions of biggest and smallest arc - Theorem and results of theorem - Numerical application on arcs of the circles - tangents of the circle: definitions of tangent and tangent point. - Theorem and results of theorem - Numerical application on circle tangents . - circles tangency: definitions of circles tangency from internal and from outside, and tangent point. - Theorem and results of theorem - Numerical application on circle tangency - Tangency angles: definitions of angle tangent, sector. - Theorem and results of theorem - Numerical application on circle tangency <p>laws of circle:</p> <ul style="list-style-type: none"> - area, and perimeter of circle - Numerical application on circle laws. - Similarity:: Similarity of shapes - Similarity of triangles - Numerical applications <p>squares of sides, the triangle:</p> <ul style="list-style-type: none"> - projection of lines on other line - numerical applications on squares of, triangle 	<ul style="list-style-type: none"> - Concept of: statement, truth value of statement, - negative of statement, conditional statements and compound statements - symbols of connection (and, or, and implies, if and only if) , - truth tables of related connections (or , and , conditional connections) - using direct and indirect proof to prove the validity of conditional statements - using the truth tables to prove the equivalence of statements. - Concept and found the Cartesian coordinates of two sets, - Concept on angle, and angle in the standard setting, positive and negative angle - Concepts of Periodic functions :sin (z), cos(x), tan(x), sec(x), cot(z), and cosec(x). - Concept of straight line, slope, slope angle and equation - cases of founding the equation of straight line - the relation between parallel and perpendicular two lines - calculating the distance between point and known line - concept of circle unit, radius, and center - the circle equation if the center and radius known - founding the center and radius from a given equation - Use the relations between the Periodic functions to calculate the values of functions. - Properties of the Periodic functions : capacity, periodic 	<ul style="list-style-type: none"> - The Cartesian products. - Angles measuring (radian, and gradient). - Periodic functions. - Sine and cosine graphical representing (capacity and period). - The circular arc length. - The forms of straight line equation. - The perpendicular lines. - The distance between point and line. - Circle equation. - Geometric transformation. - Trigonometry ratios of compound angles. - Trigonometry ratios of multiple and half angles. - The area of triangle, sector and circular segment. - Trigonometric equations. - Trigonometric Identities. - Planes and Lines. - Parallel and perpendicular lines. - Parallel and perpendicular planes. - The angle of intersection of two planes. - The orthogonal projection - The skew lines.

	<p>sides.</p> <ul style="list-style-type: none"> - Solving general exercises. - Trigonometry expressions of acute angles: definitions and calculation of $\tan(x)$, $\cos(x)$, $\sec(x)$, $\operatorname{cosec}(x)$, $\cot(x)$ - Trigonometry expressions for angles (30, 45, 60). - Solving real life problems. - fundamental relationships among them. - Trigonometry identities and equations 	<ul style="list-style-type: none"> - Converting between angles from grad to radius measurement - Concept of Compound angle , - founding the sine and cosine and tangent of addition and subtraction of two angles. - calculating the trigonometric ratios of Compound angles. - Concept and solving trigonometric identical - Solving trigonometric equation - using the tables of trigonometric ratios to find the values of periodic function and angles. - Graphing the sine , cosine and tangent functions - Founding the values of periodic functions for angles: 0, 30, 300, 60, and 90 without using the tables of ratios. - Concept of geometrical transference, shifting, rotating, reflection - The formulas of the geometrical transference, shifting, rotating, reflection - The Properties of standards transference(shifting, rotating, reflection). - The Shifting formula: $S : (x, y) \rightarrow (x + a, y + b)$ - The Rotating formula: $R : (x, y) \rightarrow (x \cos(\theta) - y \sin(\theta), x \sin(\theta) + y \cos(\theta))$, with angle θ, and with opposite of the o'clock direction. - The Reflection formula in X axis: $F_x : (x, y) \rightarrow (x, -y)$ - The Reflection formula in Y axis: $F_y : (x, y) \rightarrow (-x, y)$ - The Reflection formula in original point: $F_o : (x, y) \rightarrow (-x, -y)$ - reflection formula in the line $y = x$, $F_{(y=x)} : (x, y) \rightarrow (y, x)$ - Concept and properties of non standard transference(Dilation and Extension) 	
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		<ul style="list-style-type: none"> - The formulas of the non geometrical transference: - The Dilation formulas: $D : (x, y) \rightarrow (mx, y)$ - The Extension formulas: $E : (x, y) \rightarrow (x, my)$ - Represent geometrical transference of the points using the coordinates. - Concept and formula of identity shifting: $S : (x, y) \rightarrow (x, y)$ - Calculating the geometrical transference, shifting, rotating, reflection of the points - Concept and properties of composite geometrical transference, - Concept of plane, space, line, parallel, perpendicular, even angle status of lines in plane, projection. - The condition of identifying a plane - The relations between known line and known plane - The relation between two Parallel lines in space - The relation between two perpendicular lines in space - The relation between two Parallel or perpendicular planes in space - The relations between planes in space - The perpendicular projection - Projection point on plane, and on line - Projection of line on other line. 	
Measurement	-----	-----	-----
Data Analysis and Probability	-----	-----	<ul style="list-style-type: none"> - Data dispersion through frequency distribution curves. - Deviation measurements :the range and the standard deviation. - Effect of linear transformation on measurements of tendency and deviation.

The mathematical content Analysis of mathematics curriculum for the **Eleventh grade** in light of the standards of content among the sub-periods of development.

Standards / Periods	The first period (1964 – 1972)	The second period (1972 – 1987)	The third period (1987 – 1999)
Number and Operations	<ul style="list-style-type: none"> - Number system:: Set of Natural numbers and integer, properties of addition and multiplication operations as a groups and ring natural - Rational numbers and properties of addition and multiplication operations as a group and ring and field - Set of Real number - Using the Mathematical induction to prove the summation of sequences and geometrical sequences. - Numerical systems to base other than ten, and simple mathematical operations. 	<ul style="list-style-type: none"> - Concept of :complex number, component (real and imaginary) , basic operations, polar coordinate , scale of numbers, and roots of complex numbers. - Adding the complex numbers - Multiplication and division complex numbers - Multiply complex numbers with radical - Properties of complex numbers as a system. - Founding the scale and capacity of complex number - Concept and properties of the cubic root of one. - the concepts of number base, number exponent, logarithm base, normal logarithm, and exponential and logarithm functions - laws of operations on exponentials and logarithms with rational exponent. - founding the logarithms of numbers through the tables of algorithms - concept of : matrix, entry of matrix, order, matrix with one row and matrix with one column, square matrix - conditions of equal two matrix - matrices addition, and properties of addition operation - matrices multiplication, and properties of multiplication operation - concept and founding the determinate of square matrix - the properties of matrices as a group, - concept and founding of matrix inverse in addition and multiplication - Concept of :vector, equal vectors, operations on 	<ul style="list-style-type: none"> - Index numbers. - Real numbers - Properties of Order relation. - Limited Intervals and unlimited and representation on line numbers. - absolute value and properties. - Exponential and logarithms - Logarithms laws. - Using logarithms tables to finding common logarithms. - Matrices and determinates - Matrix and determinate. - Basic Operations on matrices. - Unity and inverse of matrices. - Counting principles and binomial theory - Counting techniques. - Permutations - Combinations - Binomials theory - Sequences and series - sequence and series, - Arithmetic sequence and series. - Geometrical sequence and series. - unlimited geometrical series.

		<p>vectors(addition, multiplication), zero and unit vectors, magnitude of vector, dot product and cross product of vectors, scalar vector, and equivalent of two vectors.</p> <ul style="list-style-type: none"> - Properties of dot product of vectors. - Concept of : permutations and symbol , combinations and symbol, summation symbol ? , mathematical induction, numbers factorial, binomial, general term, ratio between two terms, largest term, and middle term. - Founding the numbers of permutations Using the theorems - Founding the numbers of combinations Using the theorems - the theorems Proof related to the summations - Concept of : sequence, general term, limited series, and unlimited - Arithmetic sequence and Arithmetic series - geometrical sequence and unlimited geometrical series - founding the summation of Arithmetic series - founding the summation of geometrical series. - concept and founding the arithmetic average, and geometrical average for numbers are formative a sequence. - concept of absolute value for number, and function - properties of the absolute value - concept of function limit (right and left), and founding the limit of functions - concept of continuity on interval , and identifying the continuous functions - using the theorems of limits to calculating the limit of a given functions - verifying the continuity of function at point. 	
Algebra	- Relations: type of relations (refle xive,	- Concept of group, symmetrical groups,	- Solving linear equations and inequalities on real

	<p>symmetric, transitive, equivalence).</p> <ul style="list-style-type: none"> - Graphing of relations with two pairs of coordinates. - Functions: the concepts of domain and range - polynomials and algebraic functions. - exponential functions, and logarithmic functions. - the forms of straight line equations - $y = ax + c$ - $y - y_1 = a(x - x_1)$ - $ax + by + c = 0$ 	<p>subgroup, cyclic group, isomorphism,</p> <ul style="list-style-type: none"> - Properties of mathematical system: closed, associative, commutative, unique element, and inverse element. - Solving problems on groups. - drawing the graphs of logarithms and exponential functions - the relation between the logarithms and exponential functions - solving system of equation with two or three variables using the matrices. - Facts of operations on vectors - Finding the vector equation of line - Finding the general terms for solving $(x + a)^n$. - Finding the middle term in solving $(x + a)^n$. - Calculating the $p(n, r)$, and $\binom{n}{r}$. - finding the general term of Arithmetic sequence - limit of sequence, and properties. - Properties of sequence, base, limited, unlimited, higher and lower terms - Finding number of terms of finite and infinite geometrical series - the concepts of polynomial function, and finding the degree - condition of equal two polynomial functions - concept of rational function, and finding the domain and range - concept of addition and multiplication of polynomial functions, and finding the degree, domain and range - concept of prime and non prime functions - concept of division polynomial functions - concept of remainder theory, and use to analysis the polynomial function 	<p>number.</p> <ul style="list-style-type: none"> - Exponential function. - Concept of logarithms - Logarithm function - Solving linear equations using determinates. - trigonometric laws of transfer multiplication to addition and subtraction. - trigonometric laws of transfer addition and subtraction to multiplication. - trigonometric identities - Solving trigonometry equations.
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		<ul style="list-style-type: none"> - concept of zero of function, and founding it. - Analysis the polynomial function using the remainder theory. - concept of linear and quadratic functions, and founding the sign. - concept of greatest integer of x function - concept and calculating the rate of change of function - concept of derivative, and geometrical interpreting - the relation between the derivative of function at point and tangent slope at the same point. - Finding derivative of functions by means of the definition, - Derivative rules of constant function, addition and subtraction functions - Derivative rules of multiplication and division function - Using the rules of derivative to solve problems - The relation between the concept of Derivative and the continuity - Concept of Tangent and perpendicular slope, and founding the equation - Using De Moviere's theory in founding the n root of complex number. - 	
Geometry	<ul style="list-style-type: none"> - Analytical Geometry: the Cartesian coordinates, - the distance between two points, - the concept of slope - the slope of a straight line, - condition of lines parallel - condition of lines perpendicular - lines intersection and Fundamental theorems on their - Solid Geometry: Fundamental theorems of studying solids. 	<ul style="list-style-type: none"> - Vectors theorems and proof - Representing the vectors using the coordinates - Calculating the angle between two vectors - Identifying the angle which lies between the vector and X-axis - Identifying the angle which lies between two vectors - Representing the complex number using the polar coordinates - Converting the complex number to polar 	<ul style="list-style-type: none"> - Vectors in space: cartesian coordinates in space. - Vectors - Dot product of vectors. - Cross product of vectors - Application on vector space

	<ul style="list-style-type: none"> - Definitions and general principles,; the plane, parallel, perpendicular, the relation between line and plane , also plane with plane - Fundamental Theorems related to the relation between line and plane in parallel, intersection and perpendicular cases. - Fundamental Theorems related to the relation between two planes. - Solids: definitions of prism and cylinder , - Fundamental Theorems related to the prism and cylinder. <p>Trigonometry ratio:</p> <ul style="list-style-type: none"> - definition of positive and negative angle - Trigonometry ratio by Cartesian coordinates - Trigonometry ratio for angles (0 and 90 and multiples) - trigonometry expressions of any angle, - graphing the Trigonometry functions. - circular measure: concept of circular unit (radius angle), - exchanging from grade to radius measures. - Founding the circular arc, piece and sectors area. - Compound angles: trigonometry ratio for sum and difference angles - Trigonometry ratio for multiple angles <p>Exchanging from sum and difference ratio to multiplication product.</p>	<p>coordinate</p> <ul style="list-style-type: none"> - Verifying from properties of group - fundamental facts and theorems related to groups. - Proving mathematical statements using the mathematical induction. - prove theorem of limit of addition and subtraction functions, - prove theorem of limit of multiplication and division functions. 	
Measurement	<ul style="list-style-type: none"> - Speed, velocity and acceleration - Compound motion (movement) - projectiles, force, and motion laws - circular motion: velocity circular and acceleration circular 	<ul style="list-style-type: none"> - solving applications problems using the logarithms - Using series idea to transfer periodic decimals fractions to rational number - Physical application on derivative , and finding velocity and acceleration among a given relation of motion 	-----

Data Analysis and Probability	-----	-----	<ul style="list-style-type: none"> - Samples and methods of selecting - Normal distribution - Correlation - Regressions
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The mathematical content Analysis of mathematics curriculum for the **Twelfth grade** in light of the standards of content among the sub-periods of development.

Standards / Periods	The first period (1964 – 1972)	The second period (1972 – 1987)	The third period (1987 – 1999)
Number and Operation	Introduction on : <ul style="list-style-type: none"> - Permutations and combinations, - binomial theory with integers and natural exponential , - Number system: include reviewing to the topics in the previous class. - complex numbers and De Moivre’s Theorem. - Properties of addition and multiplication operations on real number as a field. 	<ul style="list-style-type: none"> - Reviewing to the concepts and skills of : calculating the rate of change of function, limit of function, right limit , left limit, continuity at point, and derivative. - Reviewing to the fundamental theorems of limits and continuity. - Founding the upper and lower summation of systematic partition. - Using the fundamental properties in calculating the integration values of a given functions. 	<ul style="list-style-type: none"> - Complex numbers: Represent complex number by symbol and formula - operations on complex numbers. - square root of complex numbers - solving equation using complex number system. limits and continuity <ul style="list-style-type: none"> - limits at point - theorems in limits - continuous and theorems. - Properties of continuous functions.
Algebra	<ul style="list-style-type: none"> - Limits - The first derivative - Founding the first derivative using the limits (definition). - Rules of differential - applications of differential : speed, and acceleration, maximum and minimum values. - Integration - Definition of integral calculus (limited and unlimited), 	<ul style="list-style-type: none"> - Finding derivative of functions by means of the definition. - Reviewing to the fundamental theorems of derivative - Theorems in continuity : conservative sign, Belzano theory, intermediate-value. - Concept of trigonometric derivatives, and founding the derivatives of functions - Derivatives of rational functions - Concept of chain rule and finding the derivative - Solving application problem on rate related to the time - Solving problems on higher derivatives using the chain rules. Application on differentiation <ul style="list-style-type: none"> - Concept and describing of local extreme 	<ul style="list-style-type: none"> - sine law, and cosine law - solving the triangles in general - Solving applications in two and three dimension among its. - Differentiation: average rate derivative - rules of derivative - higher derivatives - chain rule derivative - periodic functions derivative - implicit derivatives application on differentiation <ul style="list-style-type: none"> - related rates applications - intermediate-value theorem. - First derivative (periods of increasing and decreasing functions) applications. - local extreme values of functions

		<p>values, maximum and minimum values</p> <ul style="list-style-type: none"> - Concepts and describing of decreasing and increasing functions, - Fundamental Theorems on differential applications - Finding the domains (intervals) of decreasing and increasing to a given functions - Finding the local extreme values, maximum and minimum values of a given functions. - Concept of the sign for the first derivative, - Concept of critical point, test of critical point, - Finding the critical points for a given functions, and test the derivative sign - Concept of concave to up and down for function - Concept of Inflection point , and finding for a given function - Using the second derivative to identified the interval of concaves (up and down) - Finding the inflection point to discuss the property of functions. - Using the properties of first and second derivative to draw the curves of functions. - Solving applications problem on the second derivative - Drawing the graph of some rational functions <p>Integration</p> <ul style="list-style-type: none"> - Concept of partition, advance partition, and systematic partition, and summation - Definition of integration as a limit of summation of systematic partition. 	<p>(maximums and minimums values).</p> <ul style="list-style-type: none"> - Second derivative and applications (periods of concave up and down of functions). - Real life applications on local extreme values. <p>Integration and application</p> <ul style="list-style-type: none"> - limited integration and properties. - The fundamental theorem in Differentiation and Integration. - Unlimited integration - integration of logarithmic and exponential functions. - Methods of integration.
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Geometry	<ul style="list-style-type: none"> - Circle: the equation of circle if center and radius known , the general form of circle equation, - the relationship between a line and a circle and founding the length of tangent - the relationships between two circles in cases tangency and intersection . <p>Solid Geometry</p> <ul style="list-style-type: none"> - Review of prism and cylinder. - The concepts of Pyramid and cone, and fundamental theorems on their. - The concept of sphere, and Fundamental 	<ul style="list-style-type: none"> - Proof the theorems related to the rules of derivative. <p>Conic sections</p> <ul style="list-style-type: none"> - Concept of : geometrical location, and conic section. - Concept of parabola, and the standard equations. - Concept of hyperbola, and the standard equations. - Concept of ellipse, and the standard equations. - Using the Properties of parabola, ellipse, 	<p>conic sections</p> <ul style="list-style-type: none"> - Concept of conic sections: - Parabola , standards parametric equations and properties. - Ellipse standards parametric equations and properties. - Hyperbola standards parametric equations and properties. - Solving problems by using the standard forms of conic sections. - Representing complex numbers using Polar coordinate.

	<p>theorems on it.</p> <ul style="list-style-type: none"> - Representing the complex numbers by polar coordinates. <p>Trigonometry</p> <ul style="list-style-type: none"> - The relationship between sides and angles of a triangle, - finding the general solution of a right triangle - applying the trigonometric expressions on finding the distance and height. 	<p>and hyperbola and finding the equation.</p> <ul style="list-style-type: none"> - Drawing the conic section if the equation is given. - Finding the tangent and perpendicular equation at point lies in it. - 	
Measurement	<ul style="list-style-type: none"> - Calculating areas and volumes of Pyramid, sphere and cone . - applications of integral calculation (areas and volume). - Newton's laws of motion, - momentum, - work, power, energy, - friction and equilibrium 	<ul style="list-style-type: none"> - Founding the roots of polynomial functions using Belzano theorem. - Applications on derivatives: problems on velocity and acceleration. - The concept of area and volume which lies between the curve of function and coordinates axes. - Using the integration concept to find the area that lies between the curve of function and coordinates axes. - Using the integration concept to find the volume which lies between the curve of function and coordinates axes. 	<ul style="list-style-type: none"> - applications on integration to find the areas and volume of shapes. - Using properties of continuous functions to approximate the roots of functions.
Data Analysis and Probability	<p>Statistics,</p> <ul style="list-style-type: none"> - Statistics data, graphing of statistic data, - measurement of central tendency, - deviation measurements, - normal distribution. - Coefficient of correlation <p>Probability</p> <ul style="list-style-type: none"> - Concept of probability and, random variable, expectation, - Sample space and experimental - laws of probability, - independent events and - binomial distribution. 	<p>Statistics</p> <ul style="list-style-type: none"> - Describing and concept of: Collecting and organizing data, representing data: pie chart, bar graph, histogram, and frequency polygon. - Concept of the measurements of central tendency (mean, median, mode). - Calculating the measurements of central tendency (mean, median, mode). - Concept and finding the measurements of deviation (variance , standard deviation and average deviation). - Calculating the measurements of deviation 	<ul style="list-style-type: none"> - concept of probability and their laws. - condition probability and independent probability distribution - random variable and function of density probability - compute expectation and solving problems.

		<p>(variance , standard deviation and average deviation).</p> <ul style="list-style-type: none"> - Concept and calculating the correlation coefficient, - Effects of the arithmetic operation on the measurements of tendency, deviation and correlation coefficient. - The concept of normal distribution, the figure of distribution. - Solving problems by using the tables of normal distribution. <p>Concept and finding the regression equation.</p> <p>Probability</p> <ul style="list-style-type: none"> - Describing the Concept of : random experiment, sample space, simple event, disjoint events, probability function. - Proof the theorems related to the laws of probability. - Fundamental laws of probability. - Using the fundamental laws of probability to solve problems. - Concept of independent events , conditional probability - Solving problems on independent events , conditional probability - Using Bayer's Theory in solving problems. - Concept of :random variable, probability distribution, - Using binomial random variable to find the probability. - Finding the expectation of random variables 	
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