Appendix (3)

Translation the mathematics curriculum in Jordan during the Second period 1972 – 1987.

This appendix includes a description of the documents of mathematics curriculum in Jordan during the first period 1972 - 1987. Also, this appendix includes the translation of the learning objectives and mathematical content translated from Arabic language to English.
During this period there are two documents for teaching mathematics credited by Ministry of Education (M.O.E.) the first document for Elementary grades which includes (1 – 6 grades) ; and the second document for preparatory and secondary stages which includes (7 – 12 grades).

Firstly: Mathematics Curriculum for Elementary stage (1 - 6 grades)

The curriculum document for Elementary grades (MOE, 1984) includes the following aspects:

- ***The learning objectives*** *of teaching mathematics for Elementary grades.*
- ***The Curriculum content***:

1) Mathematics curriculum for the first grade.
2) Mathematics curriculum for the second grade
3) Mathematics curriculum for the third grade
4) Mathematics curriculum for the fourth grade
5) Mathematics curriculum for the fifth grade
6) Mathematics curriculum for the sixth grade

- General guidelines and Suggestions for teaching mathematics in Elementary grades.
- The distribution of weekly periods for teaching mathematics on grades.
- General guidelines in mathematics Evaluation.
- Appendix classify the scope and sequences of mathematical content among the grades.

1.1 The learning objectives of teaching mathematics for the Elementary stage (1 - 6 grades).

The document of mathematics curriculum which approved by the Ministry of Education in Jordan for this period specifies learning objectives for the Elementary stage, from 1 to 6 grade, as follow:

- The students' need to understand the concepts and terms on which mathematical and geometric operations are principally based.
- To develop the numerical skills of students first by then by practice.
- To develop their ability to use mathematical and geometric facts and concepts in their real life.
- To develop their ability to think logically using numbers and comparisons, and develop their comprehension of related concept and bases.
- To develop their ability in using logical approaches to understand, solve problems, summarize results and express ideas using the exact mathematical terms.

- To provide them with the skills necessary in other fields and to pursue further education.
- To develop accuracy skills in their personal, academic and working lives.
- To develop a positive attitude towards mathematics, enhance their self-confidence and their ability to deal with different situations.

1. 2 The mathematical content of teaching mathematics for the Elementary stage (1-6 grades).

The mathematical content for all educational stages during this period (1972 – 1987), organized in the documents of mathematics curriculum through identifying and presenting the mathematical content for each grade according to the instructional units form, whereas each page contains on three columns, the first column includes on the topics of instructional units, and the second column includes on the mathematical content which includes on identifying the concepts, generalizations and skills related to the unit topics, and the third column includes on the behaviors objectives of learning related to the mathematical content and unit topics.
As an example on describing how the mathematical content is presented in the documents of mathematics curriculum, the following table explain one page of how the content is organized and presented through the curriculum document for elementary grades (second grade) in the **Number topic** :

Unit(Topic)	**The content**	**Behavior objectives**
Unit (1) Numbers within 99	Concepts: -Carrying, borrowing, unit place, tens' place, digit value. Facts and Generalization : -Fundamental facts of addition within (99). -Fundamental facts of subtraction within (99). Skills: -Numbers addition within 99 with carrying. -Numbers subtraction within 99 with borrowing.	*Students should be capable to:* -Read, write, order and compare numbers within 0 to 99 -Understand the different between place and unit digit of numbers -Found result of numbers addition within 99 by carrying -Found result of numbers subtraction within 99 by borrowing. -Solve real life problems using the addition and subtraction operations.
Unit (3) Number theory	Concepts: -Concept of odd and even number. Generalization : -Summation of two even numbers is even number. -Summation of two odd numbers is even number.	*Students should be capable to:* -Distinguish between odd and even numbers -Explain summation of two even numbers is even number, and Summation of two odd numbers is even number. -Construct addition table for given set of numbers -Count using multiples of 2 to 20, and 3 to 30, and 4 to 40, and 5 to 50.

The mathematical content for all the grades of Elementary stage translated to English language, as a summary according to the instructional units (topics) and the mathematical content, which it included in the document, and organizing in tables for all grades (1 to 6) as follow:

Unit (Topic)	The mathematical content of 1st grade
Pre-counting	- Set – one to one corresponding - greater that (!) ,and less than ( ) - equivalent and non equivalent sets,
Numbers from 0 to 9	- numbers from (0) up to (9), the concept and figures, - empty set - counting from 1 to 9 - ten as a unit, the figure of (10), - counting by adding tens up to (90), - The concepts of numbers from 11 to 99: reading and writing. - The components of (10).
Numbers ordering	- Concepts of : before, after, between, greater than, less than - writing numbers using greater that (!) , less than ( ), - ordering numbers and line of numbers
Addition within number 9	- The concept and sign of addition (+), and sign = - Facts of addition within 9 - The Commutative property on addition - Adding horizontally and vertically without bridging within the number (9).
Subtracting within number 9	- The concept and sign of subtraction (-) - Facts of subtraction within (9). - subtraction horizontally and vertically within the number (9).
Addition and subtraction numbers within 99	- The concepts of numbers from 10 to 99 - Place value - Facts of addition and subtraction both horizontally and vertically within (99). - Adding and subtracting two digits of numbers without carrying and without borrowing .
Fractions	- Concepts of the fractions: half and quarter
Measurement	- Money : dinar and pence - Foot and span - Week days - Volume : cup and glass
Geometry	- Recognize on triangle ,square, rectangle and circle shapes

Unit (topics)	The mathematical content of 2nd grade
The Numbers within 99	- The concepts of numbers up to 99: reading and writing. - The concepts addition by carrying - The concepts of subtraction by borrow - 10 as a unit, and the place value. - Facts of addition within 99 - Facts of subtraction within (99). - Adding and subtracting numbers within by carrying and borrowing.
The Numbers up to 999	- The concepts of numbers from 0 to 999: reading and writing. - The place value of numbers - Adding numbers horizontally and vertically within 999 using carrying. - Subtracting numbers horizontally and vertically within 999 by borrowing.
Number Theory	- Concepts of Even and odd numbers. - the summation of two even numbers is again an even number - The summation of two odd numbers is an even number.
Multiplication	- The concept and sign of multiplication as a process

and Division	repeated of addition. - fact of multiplication within 50 - properties of the 0 and 1 in multiplication operation - The Commutative property on multiplication. - Division as opposite operation of multiplication
Fraction and Money and Measurement	- concepts of Fractions: 1\2, 1\4, 3\4 reading and writing. - Money : dinar and half, and quarter - Time :Reading the hours - Week days, and months - Length : meter
Geometry Concepts	- concepts of the square and rectangle - constructing the geometrical shapes by cutting.

Unit (Topic)	**The mathematical content of 3rd grade**
The Numbers up to 9999 addition and subtraction	- the place values of numbers - Numbers ordering within 9999 - Adding two numbers by carrying horizontally and vertically within (9999). - Adding numbers horizontally and vertically within (9999). - Subtracting two numbers horizontally and vertically within the number (9999).
Multiplication and Division	- Concept and properties of multiplication and Division operations - Facts of multiplication up to 5x10 - Facts of division up to 5x10 - Facts of multiplication within 100 - Facts of division within 100 - Division as opposite operation of multiplication - 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.
Geometrical concepts	- 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.
The Common Fractions	- The concepts of common fractions - reading and writing common fractions with denominator less than or equals 8 , - equivalent fractions
Measurement and Money	- 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.

Unit (Topic)	The mathematical content of 4th grade
Concepts of Numbers within 7 digits	- Numbers up to 7 digits: reading and writing. - Place value of Numbers consisting seven digits.
The four operations on Numbers	- 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.
Numbers theory	- Even and odd numbers. - Factors and multiples. - Divisibility by 2, 3 and 5. - Founding the factors and multiples of a given number - Founding the greatest common divisor of two numbers or more than. - Founding the lower common multiple of two numbers or more than. - Fractions cancellation. - Applying divisibility by 2 , 3, and 5 to reduce fractions
Addition and subtraction common fractions	- Concepts of common Fractions, equivalent fractions, fractions of equal denominator - converting mixed numbers into common fractions - addition and subtraction of identical common fractions, - addition and subtraction of common fractions with common denominator less than or equals 24.
Decimal fractions	- Meter and parts, money , dinar and his parts as introduction to concept of decimal fraction. - The concept of decimal fraction, writing decimal fractions of three decimal places. - Addition and subtraction of decimal fractions.
Geometry	- 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

Contents	The mathematical content of 5th grade
Natural numbers and Operations	- Concepts of Natural numbers up to 10 to power 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. - Solving problems and Checking the validity of solutions for problems involving the four fundamental operations.
Number Theory	- Divisibility by 4, 6, 9 and 10. - Multiples and divisors of number. Divisibility by 4, 6 and 9. - Prime numbers, the set of the number's divisors. - Prime factors of number. - The greatest common divisor of two or three numbers - the least common multiple, of two or three numbers.
Common Fractions	- Concepts of Common fractions, equivalent fractions, ordering of common fractions. - The four fundamental arithmetic operations on common fractions, - Real life Problem solving includes fractions with three steps. - Commutative , associate and distribution properties

Decimal 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 - Solving problems on decimal fractions includes two steps.
Geometry	- 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. - Areas of square, rectangle and parallelogram, - Identifying the dimensions of cube and rectangular solid - finding their volume and total surface area of cube.
Areas of figures	- Concepts of area, surface area, total area, and square unit - Relation and laws of finding the areas of given geometrical figures - Solve practical problems on areas of geometrical figures

Contents	**The mathematical content of 6th grade**
Mathematical problem	- Concept of solving problem - Steps of solving problems - Analyzing the problems, identified the known and unknown data - Plane of solving - Checking the validity of solution
Number Theory	- 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
Ratio and proportionality	- 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.
Measurement Units	- Length units: Meter (multiples and part). - Area units: square meter (multiples and part). - 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.
Area and Volume	- 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 lateral and total surface areas of right cylinder.

Secondly: Mathematics Curriculum for preparatory and secondary stages (7 to 12 grades).

The curriculum document of mathematics for preparatory and secondary stages in Jordan (MOE, 1984) includes the following aspects;

- The learning objectives of teaching mathematics in preparatory and secondary stages.
- Mathematical content for preparatory grades (7 – 9).
- Mathematical content for secondary grades (10 – 12).
- General guidelines and Suggestions for teaching mathematics in preparatory and secondary stages.
- The distribution of weekly periods for teaching mathematics on grades.
- General guidelines in mathematics Evaluation.
- Appendix classified the scope and sequences of mathematical.
- 2.1 The learning objectives of teaching mathematics for the preparatory and secondary stage.
- The mathematics curriculum for preparatory and secondary stage includes on the following learning objectives:
- To introduce mathematical terms and their features to students and help them to develop the accuracy required in their use.
- To enable them to use those terms to correctly express their ideas and communicate them to others.
- To develop their ability to think logically, use mathematical proof and employ the same to understand and solve problem.
- To develop their understanding of the nature of mathematics as an organized structure of knowledge.
- To develop their skill in making calculations using different tools.
- To expand their perception of their physical surrounding using mathematical models.
- To introduce new methods used in the organization of data, statistical tools and operational maps.
- To provide them with knowledge of the scientific methods used to test, analyze situations and decide on proper solutions.
- To encourage within students the tendency to question, innovate and research.
- To provide them with the skills necessary in other fields and to pursue further education.
- To enable them to explore the aspects of beauty and harmony in mathematics.
- To enable them to comprehend the social and informative contribution of the field of mathematics through different ages.

2.2 The mathematical content of teaching mathematics for the preparatory and secondary stages.

The mathematical content for preparatory and secondary stages organized and presented through the document such as the presentation in the elementary grades, whereas the documents of mathematics curriculum identifying and presenting the mathematical content for each grade according to the instructional units form, so each page contains

on three columns, the first column includes on the topics of instructional units, and the second column includes on the mathematical content which includes on identifying the concepts, generalizations and skills related to the unit topics, and the third column includes on the behaviors objectives of learning related to the mathematical content and unit topics. The summary of translating to English language of the mathematical content for all grades (7 to 12), according to the instructional units and the mathematical content organized presented in tables for each stage.

2.2.1 The mathematical content of teaching mathematics for the preparatory (7 to 9 grade) stage.

This stage includes on three grades, represented with, the first grade, second grade and the third grade. The following tables representing a summary of translating to English language of the mathematical content for grades (7 to 9), according to the instructional units and the mathematical content as follow:

Content (topics)	**The mathematical content for 7th grade (the fist of preparatory stage)**
Groups	- 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,
The Plane Geometry	- 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. - Drawing parallel lines using the ruler and triangle.
Integers Numbers	- Concepts of: integer number, commutative, closed and association, open set, equation, solution set, substitution set, inquality, negative number, integers set , unique element. - Generalizations related to the relation between integers numbers and - Basic operation on integers numbers and their properties
Factors Analysis	- Concept of : algebraic term, algebraic expressions, factors analysis, common factors, numbers power,sest 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
Rational Numbers	- 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 numbers. - Write the rational numbers in simple form - Convert the infinite periodic decimal fractions to finite fraction - Convert the rational numbers to decimal fractions
Inequalities and Equations	- 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
Areas and closed Curves	- 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 founding the areas. - Concept of Pythagoras theorem, - Solving problems by using Pythagoras theorem
Geometrical Solids	- 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

Content (topics)	**The mathematical content for 8th grade (second of preparatory stage)**
Relations and functions	- concept of relation, domain, range and image - Relations expressions and graphing relations. - the concept of function, domain, range and image equal functions. - The expressions and properties of relation and function - Using expressions of function and graphing functions
Sets of numbers	- Concept of Real number, rational and irrational numbers, - Square root of number, numbers powers, Integer and rational exponents - Intervals and kinds of intervals on sets of numbers - Decimal and approximated representation. - Operations, properties of operations, on real numbers. - Rules of integer and rational exponents on sets of numbers. - Using the rules of exponents to simplify the algebraic expressions.
Arithmetic and algebraic operations	- Concept of ratio, percentage, proportion: directly and inversely proportional quantities, proportional division, gain and loss, simple and compound interest, bills discount, insurance, - multiplication of algebraic expression, - algebraic expression analysis: difference of two squares, sum and difference of two cubic terms, - factorizing of three-term expressions, - calculating roots of numbers - Solving real life problems on algebraic operations
Geometry	- 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 - geometric constructions using ruler and compasses, - 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. - Drawing the geometrical figures in light of their properties.
Equations and inequalities	- 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
Mathematical structures	- Sets: whole set, complement of a set, isolating sets, - properties of union and intersection on sets. - De Morgan laws. - 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

Content (topics)	The mathematical content for 9th grade (third of preparatory stage
Mathematical system	- 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
Arithmetic and algebraic operations	- 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 - 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.
Geometry	- Analytic geometry: rectangular coordinates, original coordinate, mid-point - 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 - Circle: center, radius , diameter, chords and arcs of circle, - 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
Quadratic equations and functions	- 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
Factors analysis	- 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, - the relationship between discriminator and roots of quadratic equations
Trigonometric Ratio	- 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 - 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

Statistics and probability	- 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

2.2.2 The mathematical content of teaching mathematics for the Secondary stage.

This stage includes on three grades , represented with, the first secondary grade, the second secondary grade and the third secondary grade, also, the curriculum after the first secondary divided into two branches (scientific and literary), the mathematical content which included in the document organized as a summary in tables for these grades, as follow:

Content (topics)	**The mathematical content for 10^{th} grade the first secondary grade**
Logic and methods of proof	- 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) - equivalence statements, open statement, - set of substitution ,set of solution, solution of open statements, - using direct and indirect proof to prove the validity of conditional statements - Using the truth tables to prove the equivalence of statements.
Relations and functions	- Concept and found the Cartesian coordinates of two sets, - 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
Mathematical systems	- Concept of Binary operation on sets of numbers, - Properties of Binary operation(closed, commutative, associative, unique element, inverse of element) - 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 - Concept and properties of integers numbers
Numerical systems and programming	- 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. - Drawing flowcharts explain the steps of solving problems.

The Periodic functions	- 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). - Use the relations between the Periodic functions to calculate the values of functions. - Properties of the Periodic functions : capacity, periodic - 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.
Analytical Geometry	- 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 - tangent equation of circle at given point
Geometrical transferences	- 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) ? (x + a , y + b) - The Rotating formula: R : (x , y) ? (x cos(?) – y sin(?) , a , x sin(?) + y cos(?)) , with angle ? , and with opposite of the o'clock direction. - The Reflection formula in X axis: Fx : (x , y) ? (x , - y) - The Reflection formula in Y axis: Fy : (x , y) ? (- x , y) - The Reflection formula in original point: Fo : (x , y) ? (- x ,- y) - reflection formula in the line y = x , F : (x , y) ? (y , x) - Concept and properties of non standard transference(Dilation and Extension) - The formulas of the non geometrical transference: - The Dilation formulas: D : (x , y) ? (mx , y) - The Extension formulas: E : (x , y) ? (x , my) - Represent geometrical transference of the points using the coordinates. - Concept and formula of identity shifting: S:(x ,y) ? (x ,y) - Calculating the geometrical transference, shifting, rotating, reflection of the points - Concept and properties of composite geometrical transference,
The space Geometry	- 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 - Project point on plane, and on line - Project of line on other line.

Content (topics)	The mathematical content for 11th grade the second secondary grade (the Scientific)
Logarithms	- The concepts of number base, number exponent, logarithm base, normal logarithm, and exponential and logarithm functions - laws of operations on exponentials with rational exponent - laws of operations on logarithms. - drawing the graphs of logarithms and exponential functions - the relation between the logarithms and exponential functions - founding the logarithms of numbers through the tables of algorithms - solving applications problems using the logarithms
Matrices	- 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 - solving system of equation with two or three variables using the matrices
Vectors	- Concept of :vector, equal vectors, operations on vectors(addition, multiplication), zero and unit vectors, magnitude of vector, dot product and cross product of vectors, scalar vector, and equivalent of two vectors. - Properties of dot product of vectors - Vectors theorems and proof - Facts of operations on vectors - Finding the vector equation of line - 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
Complex Numbers	- 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 - Representing the complex number using the polar coordinates - Converting the complex number to polar coordinate - Properties of complex numbers as a system. - Founding the scale and capacity of complex number - Concept and properties of the cubic root of one. - Using De Moviere's theory in founding the n root of complex number
Groups	- Concept of group, symmetrical groups, subgroup, cyclic group, isomorphism, - Properties of mathematical system: closed, associative, commutative, unique element, and inverse element. - Verifying from properties of group - fundamental facts and theorems related to groups. - Solving problems on groups.
Numbers and binomial theory	- 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 - Founding the general terms for solving $(x + a)^{n}$. - Founding the middle term in solving $(x + a)^{n}$. - Proving mathematical statements using the mathematical induction. - Calculating the $p(\mathbf{n} , \mathbf{r})$, and $({}^{n}_{r})$
Sequences and series	- Concept of : sequence, general term, limited series, and unlimited - Arithmetic sequence and Arithmetic series - geometrical sequence and unlimited geometrical series

	- founding the general term of Arithmetic sequence - founding the summation of Arithmetic series - founding the summation of geometrical series - limit of sequence, and properties - concept and founding the arithmetic average, and geometrical average - Properties of sequence , base, limited, unlimited, higher and lower terms - Using series idea to transfer periodic decimals fractions to rational number. - Finding number of terms of finite and infinite geometrical series
Polynomials and rational functions	- the concepts of polynomial function, and finding the degree - condition of equal two polynomial functions - concept of rational function , and founding the domain and range - concept of addition and multiplication of polynomial functions, and founding 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 - 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.
Limits and continuity	- concept of absolute value for number, and function - properties of the absolute value - concept of greatest integer of x function - concept of function limit (right and left), and founding the limit of functions - concept of continuity on interval , and identifying the continuous functions - theorem of limit of addition and subtraction functions, - theorem of limit of multiplication and division functions - using the theorems of limits to calculating the limit of a given functions - verifying the continuity of function at point.
Differentiation	- 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 - Physical application on derivative , and finding velocity and acceleration among a given relation of motion

Content (topics)	**The mathematical content for 12th grade the third secondary grade (the Scientific)**
Differentiation	- Reviewing to the concept s 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 - Finding derivative of functions by means of the definition. - Reviewing to the fundamental theorems of derivative - Proof the theorems related to the rules of derivative. - Theorems in continuity : conservative sign, Belzano theory, intermediate-value. - Founding the roots of polynomial functions using Belzano theory - Concept of trigonometric derivatives, and founding the derivatives of functions - Derivatives of rational functions - Concept of chain rule and finding the derivative - Applications on derivatives: problems on velocity and acceleration - Solving application problem on rate related to the time - Solving problems on higher derivatives using the chain rules.
Differentiation Applications	- Concept and describing of local extreme values, maximum and minimum values - 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
Conics Sections	- 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, and hyperbola and finding the equation. - Drawing the conic section if the equation is given. - Finding the tangent and perpendicular equation at point lies in it.
Integration and applications	- Concept of partition, advance partition, and systematic partition, and summation - Definition of integration as a limit of summation of systematic partition. - Founding the upper and lower summation of systematic partition. - Fundamental properties of integration (limited and unlimited). - Using the fundamental properties in calculating the integration values of a given functions. - The fundamental theorem :the relationship between differentiation and integration. - Concept of integration by substitution. - Using the integration by substitution to find the integration of a given functions. - Concept of integration by parts - Using the integration by parts to find the integration of a given functions - Concept of integration by partial fraction - Using the integration by partial fraction to find the integration of a given functions - concept and finding the derivatives of logarithmic and exponential functions. - Finding the integration of logarithmic and exponential functions. - Solving deferential equation using the integration. - Funding the integration of trigonometric functions. - 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. - Sketching the graphs of functions and identify the areas and volume which required.
Probability theory	- 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
Statistics	- 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 (variance , standard deviation and average deviation). - 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. - Concept and finding the regression equation.

Content (topics)	**The mathematical content for 11th grade the second secondary grade (the Literary)**
Matrices	- concept of : matrix, entry of matrix, rank of matrix, matrix with one row and matrix with one column, square matrix - conditions of equal two matrix - properties of operations, addition and subtraction matrices, - properties of multiplication operation on matrices - 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 - solving system of equation with two or three variables using the matrices
Numbers and binomial theory	- Concept of : permutations and symbol , combinations and symbol, summation symbol ? , numbers factorial, binomial, general term, ratio between two terms, largest term, and middle term. - Properties and theorems of permutations and combinations - Founding the numbers of permutations and combinations using the theorems - Solving and Founding the general terms of $(x + a)^{n}$. - Solving and Founding the middle term of $(x + a)^{n}$. - Calculating the $p(\mathbf{n} , \mathbf{r})$, and $({}^{n}_{r})$ using the relations related to its.
Sequences and series	- Concept of : sequence, general term, limited series, and unlimited - Arithmetic sequence and Arithmetic series - geometrical sequence and unlimited geometrical series - the difference between the sequence and series - founding the general term of Arithmetic sequence - founding the summation of Arithmetic series - founding the summation of geometrical series - limit of sequence, and properties - concept and founding the arithmetic average, and geometrical average - Properties of sequence , base, limited, unlimited, higher and lower terms - Finding the upper and lower term of limited sequence. - Finding result of adding and multiplying two sequences.
Logarithms	- the concepts of number base, number exponent, logarithm base, normal logarithm, and exponential and logarithm functions - laws and properties of exponentials with rational exponent - laws and properties of logarithms - using the laws and properties of logarithms and exponentials to solve problems. - drawing the graphs of logarithms and exponential functions - the relation between the logarithms and exponential functions - founding the logarithms of numbers through the tables of algorithms - simplifying the algebraic terms by using the laws of logarithms and exponentials. - solving applications problems on area and volume and simple profit using the logarithms
Calculus	- Concept of polynomial function, rational function, degree of polynomial, root of function - concept and calculating the rate of change of function - concept and symbols of derivative. - Finding derivative of functions by means of the definition, - Fundamental rules of the first derivative.

	- Using the rules of derivative to solve problems. - The relation between the slope and derivative at fixed point and founding the equation. - Physical application on velocity and time. - Geometrical application on the slope of curve.

Content (topics)	**The mathematical content for 12th grade the third secondary grade (the Literary)**
Differentiation Applications	- Reading and writing the symbols of : first derivative, higher derivatives, chain rule, - Founding the first and second derivative of the algebraic functions - Identifying the sign of the first derivative on a limited interval. - Concept and describing of local extreme values, maximum and minimum values - Concepts and describing of decreasing and increasing functions, - Finding the domains (intervals) of decreasing and increasing of a given functions - Finding the local extreme values, maximum and minimum values of a given functions. - Fundamental rules of first derivative - Concept of critical point, test of critical point, - Finding the critical points for a given functions, and test the derivative sign - Sketching the curve of some algebraic functions. - Solving applications problems on area and volume and economic and numbers by using the derivative.
Integration and applications	- concept of integration and reading and writing the symbol. - Concept and properties of limited and unlimited integration. - Using the properties of integration to find the integration of functions. - Concept of integration by substitution , and finding the integration of a given functions. - Solving simple deferential equation using integration - Using integration to find the area lies between curve of function and coordinates axes, and between two curves of functions.
Probability theory	- Describing the Concept of : random experiment, sample space, simple event, disjoint events, comprehensive events, complementary event, laws of probability. - Using the laws of probability in solving problems. - Concept of independent events , conditional probability - Solving problems on independent events , conditional probability - Concept of :random variable, probability distribution, - Using binomial random variable to find the probability. - Finding the arithmetic average of binomial random variables
Statistics	- Describing and concept of: sample, Collecting and organizing data, representing data: charts, bar graph, histogram, and frequency polygon. - Concept of distribution range, frequency table - 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 (variance , standard deviation and average deviation). - Properties of the measurements of central tendency (mean, median, mode). - Properties of the measurements of deviation (variance , standard deviation and average deviation). - Concept and calculating the correlation coefficient, - Effects of the arithmetic operation on the measurements of tendency, deviation. - The concept of normal distribution, the figure of distribution. - Solving problems by using the tables of normal distribution.