٥- الريـــــــاضيات

MIDDLE CYCLE

THE EIGHT YEAR

ARITHMETIC AND ALGEBRA

CONTENT	OBJECTIVES
1.1. g.c.d. and l.c.m. of several integers.	1. Calculate the g.c.d. and the l.c.m. of two or several integers.

GEOMETRY

CONTENT	OBJECTIVES
2.2. Relative positions of lines and planes.	1. Recognize the relative position of two lines, two planes, a line and a plane.

NINTH GRADE

ARITHMETIC AND ALGEBRA

CONTENT	OBJECTIVES
5.3. Systems of inequalities of the first degree in one unknown.	1. Solve a system of inequalities of the first degree in one unknown with numerical coefficients . 2. Organize the given of a problem, translate it by a system of two inequalities of the first degree in one unknown, solve this system and find the solutions.

GEOMETRY

CONTENT	OBJECTIVES
2.1. Intersection of a straight line and a common solid.	1. Draw the intersection of a straight line and a common solid.
2.2. Intersection of a plane and a common solid.	1. Draw the intersection of a plane and a common solid.
3.1. Inscribed quadrilaterals.	1. Know and use the necessary and sufficient conditions for a quadrilateral to fit into a circle.

FIRST YEAR SECONDARY

ALGEBRA

CONTENT	OBJECTIVES
1.2. Cartesian product.	1. Writing in extension the Cartesian product of two finite sets.
1.3. Mapping, bijection.	1. Identifying a mapping. 2. Identifying a bijection.
Under the title: 2.4. "Framing. Approximation", we eliminate:	1. Identifying an approximation of a real number. 2. Interpreting in terms of the absolute value the fact that a real number a is an approximation nearest to ε of a real number x. Case where $\varepsilon = 10^{-n}$.
Under the title: 3.1. "Equation of the first degree", we eliminate:	▪ Discussing and solving a parametric equation of the first degree in one unknown.

GEOMETRY

CONTENT	OBJECTIVES
2.2. Projection in the plane.	1. Defining the projections of a point, of a vector on a straight line parallel to a given direction and evolving the essential properties.

SECOND YEAR – HUMANITIES SECTION

ALGEBRA

CONTENT	OBJECTIVES
1.1. Binary relations.	1. Recognize a binary relation. 2. Recognize an equivalence relation. 3. Recognize an order relation.

SECOND YEAR – SCIENTIFIC SECTIONS

ALGEBRA

CONTENT	OBJECTIVES
1.1. Binary relations.	1. Identify a binary relation on a set. 2. List the elements of the graph of a binary relation on a finite set. 3. Identify an equivalence relation. 4. List the members of the equivalence class of an element. 5. Determine the partition associated with an equivalence relation. 6. Identify an order relation.
3.1. System of linear equations (3×3). Linear programming.	1. Translate the constraints of a linear programming problem into the form of a system of linear inequalities and an economic function. 2. Find graphically the optimal solution of a problem of linear programming.

CONTENT	OBJECTIVES
4.1. Euclidean division of a polynomial by another.	1. Perform the Euclidean division of a polynomial by another.
Under the title: 4.2. "Factorization. Simplification of rational fractions", we eliminate:	1. Use factorization to simplify a rational fraction.

GEOMETRY

CONTENT	OBJECTIVES
1.2. Projections in space.	1. Characterize the projections of a point and a plane figure on a plane parallel to a given direction. 2. Characterize the projections of a point and a vector on a line parallel to a given plane. 3. Deduce the properties of orthogonal projection on a plane and a line.
1.3. Solids.	1. Recognize a prism, a pyramid, a cone, a cylinder and a sphere. 2. Know the expression of the lateral area and the volume of each of these solids. 3. Determine the intersection of a cone and a cylinder with a plane parallel to the base. 4. Study the relative position of a plane.

THIRD YEAR – LITTERATURE AND HUMANITIES SECTION

ALGEBRA

CONTENT	OBJECTIVES
1.1. Binary operation.	1. Identify a binary operation. 2. Recognize the properties of a binary operation. 3. Recognize certain particular elements.
1.2. Structure of group.	1. Define a group.

CONTENT	OBJECTIVES
1.3 Exponential growth and exponential function.	1. Calculate a^x for a real positive number a in the two cases $a > 1$ and $0 < a < 1$. 2. Know and use the properties: $a^x . a^y = a^{x+y}$. $\left(a^x\right)^y = a^{xy}$.

THIRD YEAR - SOCIOLOGY AND ECONOMICS SECTION

ALGEBRA

CONTENT	OBJECTIVES
1.1. Binary operation.	1. Identify a binary operation. 2. Recognize the properties of a binary operation. 3. Recognize certain particular elements.
1.2. Structure of group.	1. Define a group.
3.1. Systems of linear equations ($m \times n$): definition, elementary operations on the equations, Gauss' method.	1. Identify a linear system ($m \times n$). 2. Spread out a linear system ($m \times n$) by successive applications of elementary operations. 3. Solve a linear system ($m \times n$) by the Gauss' method.

CALCULUS (NUMERICAL FUNCTIONS)

CONTENT	OBJECTIVES
Under the title: 1.3. "Natural (Napierian) logarithmic fuction. Logarithmic function to the base a", we eliminate:	3. Know the relation which links the function ln to the logarithmic function to base a ($a > 0$ and $a \neq 1$) and deduce the properties of the latter.
Under the title: 1.4. "Exponential functions", we eliminate:	2. Study and represent graphically the exponential function to base a. 3. Study the power function $x \rightarrow x^\alpha$. 4. Compare the increase of the functions ln, $x \rightarrow e^x$ et $x \rightarrow x^\alpha$.

CONTENT	OBJECTIVES
Under the title: 2.2. "Second derivative", we eliminate	▪ Calculate the second derivative of the reciprocal function at a point.
4.1. Differential equations (Definition).	1. Identify a differential equation and determine its order.
4.2. Equations of separable variables.	1. Identify and solve an equation of separable variables.
4.3. Linear first order equations with constant coefficients.	1. Identify and solve a linear differential equation of the first order with constant coefficients.
4.4. Finite differences equations.	1. Identify and solve a finite differences equation with constant coefficients of the first order. 2. Solve some finite differences equations with constant coefficients of the second order.

THIRD YEAR – GENERAL SCIENCES SECTION

ALGEBRA

CONTENT	OBJECTIVES
1.1. Binary operation.	1. Identify a law of binary operation. 2. Recognize the properties of a binary operation. 3. Recognize certain particular elements.
1.2. Structure of group.	1. Define a group and give examples of groups.
3.1. Systems of linear equations $(m \times n)$: definition, elementary operations on the equations, Gauss' method.	1. Identify a linear system $(m \times n)$. 2. Reduce a linear system $(m \times n)$ by successively applying elementary operations. 3. Solve a linear system $(m \times n)$ by the Gauss' method.

GEOMETRY

CONTENT	OBJECTIVES
2.1. Level curves $\left(\overrightarrow{MA}, \overrightarrow{MB}\right) = \alpha$ (mod π or 2π).	1. Determine the level $\left(\overrightarrow{MA}, \overrightarrow{MB}\right) = \alpha$ (mod π or 2π) and characterize the cocyclicity of four points.
Under the title: 2.2. "Vector equation of a straight line, of a plane, of a sphere", we eliminate:	1. Vectorially characterize of a sphere.
3.6. Equation of a sphere.	2. Determine the equation of a sphere defined by its center and its radius or by a diameter in an orthonormal system. 3. Link the position of a point with respect to a sphere to the power of this point relative to this sphere.
3.7. Intersection of a sphere with a straight line, a plane or a sphere.	1. Determine the relative positions of a sphere with respect to a line, a plane or a sphere and determine the elements of intersection where they exist.
4.1. Displacement in the plane.	1. Characterize a displacement in the plane. 2. Study the effect of a displacement on the plane geometric figures. 3. Distinguish the isometries which are displacements and those which are not.

CALCULUS (NUMERICAL FUNCTIONS)

CONTENT	OBJECTIVES
Under the title: 1.5. "Exponential functions. Power functions", we eliminate:	2. Study and represent graphically the exponential function to base a. 3. Study the power function $x \rightarrow x^\alpha$. 4. Compare the increases of the functions ln, $x \rightarrow e^x$ and $x \rightarrow x^\alpha$.
1.7. Parametric curves.	1. Study simple curves defined parametrically.
3.3. Mean value theorem for definite integrals. Max-Min inequality.	1. Demonstrate and use the mean value theorem.

TRIGONOMETRY

CONTENT	OBJECTIVES
2.1. Solving simple trigonometric equations.	1. Solve simple trigonometric equations.

THIRD YEAR – LIFE SCIENCES SECTION

ALGEBRA

CONTENT	OBJECTIVES
1.1. Binary operation.	1. Identify a binary operation. 2. Recognize the properties of a binary operation. 3. Recognize certain particular elements.
1.2. Structure of group.	1. Define a group and give examples of groups.
3.1. Systems of linear equations ($m \times n$): definition, elementary operations on the rows, Gauss' method.	1. Identify a linear system ($m \times n$). 2. Reduce a linear system ($m \times n$) by successively applications of elementary operations. 3. Solve a linear system ($m \times n$) by the Gauss method.

CALCULUS (NUMERICAL FUNCTIONS)

CONTENT	OBJECTIVES
1.2. Inverse trigonometric functions.	1. Study the functions *Arcsin*, *Arccos* and *Arctan*.
Under the title: 1.4. "Exponential functions", we eliminate:	2. Study and represent graphically the exponential function to base a. 3. Study the power function $x \rightarrow x^{\alpha}$. 4. Compare the increases of the functions functions $ln, x \rightarrow e^x$ and $x \rightarrow x^{\alpha}$.
Under the title: 2.4. "Second derivative. Successive derivatives", we eliminate:	1. Successive derivatives of a function.

PROBABILITY

CONTENT	OBJECTIVES
2.4. Bernoulli variable.	1. Recognize a Bernoulli variable during a trial.
2.5. Binomial law.	1. Recognize a binomial law and determine its parameters characteristics.