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## **Formal Diversity and the Philosophy of the Unit Design Decorative Architectural Formations**

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### **Abstract**

**The research problem was a fundamental question:**

**What is the formal diversity in the unit of decorative architectural formations?**

**The research aims to answer the question in the problem as the research is determined by the geometric decoration and variations of the formality within the unit of formation on the facades of architecture in Baghdad in (1 42 H-14 40 e) (7 60 m - 20 19 m) The importance of research is: 1. Reveals the artistic and design foundations employed in geometric decorative formations. 2. Contributes to the awareness of the intellectual and practical aspects of students of the Faculty of Fine Arts, especially the Department of Arabic calligraphy and decoration design students. 3. The Department of Architectural Decorates works in the Faculty of Engineering, Design and Architectural Design at the Institute of Applied Arts. The theoretical framework deals with the following topics: a historical introduction about the emergence of the decoration and its mathematical relations, the geometric shapes in the buildings, as well as the conceptual-visual elements of the geometric form, as well as the relational elements and geometrical transformations, including the spatial relationship in the geometric shape. The researcher followed in his procedures descriptive analytical approach to achieve the results of achieving its objectives and solve the problem and the sample was selected in an intentional manner, where the number of samples (3)**

sample of the total (24) model. And design the tool (form) and presented to the experts to verify their validity, and achieve the objectives. The research reached results, including: 1. The geometric ornamentation in the base class depends on the construction of the basic network in the light of the available space and according to the variations of repetition, harmony and balance in the drawing of units and decorative vocabulary or the distribution of centers that generate the decorative element in the design center or on the side. 2. The architectural and architectural decoration has a mathematical structure. Mathematics is a logical system and layout in the formations of geometric ornaments in Islamic architecture if decoration is a complete form of mathematical thought. The researcher recommended to benefit from his findings and vocabulary in enhancing and activating the curriculum of engineering decoration in general, in the relevant departments within the faculties and technical institutes. The researcher proposed a study of the aesthetic characteristics of architectural forms and patterns in modern Islamic architecture in Iraq.

## **Diversidad Formal Y Filosofía Del Diseño De La Unidad Formaciones Arquitectónicas Decorativas**

### **Resumen**

El problema de investigación era una pregunta fundamental:

¿Cuál es la diversidad formal en la unidad de formaciones arquitectónicas decorativas?

La investigación tiene como objetivo responder a la pregunta del problema, ya que la investigación está determinada por la decoración geométrica y las variaciones de la formalidad dentro de la unidad de formación en las fachadas de la arquitectura en Bagdad en (1 42 H-14 40 e) (7 60 m - 20 19 m)

La importancia de la investigación es:

1. Revela los fundamentos artísticos y de diseño empleados en las formaciones decorativas geométricas.
2. Contribuye a la conciencia de los aspectos intelectuales y prácticos de los estudiantes de la Facultad de Bellas Artes, especialmente los estudiantes del Departamento de caligrafía árabe y diseño de decoración.
3. El Departamento de Decoraciones Arquitectónicas trabaja en la Facultad de Ingeniería, Diseño y Diseño Arquitectónico del Instituto de Artes Aplicadas.

El marco teórico aborda los siguientes temas: una introducción histórica sobre el surgimiento de la decoración y sus relaciones matemáticas, las formas geométricas en los edificios, así como los elementos conceptuales-visuales de la forma geométrica, así como los elementos relacionales y transformaciones geométricas, incluida la relación espacial en la forma geométrica. El investigador siguió en sus procedimientos un enfoque analítico descriptivo para lograr los resultados de alcanzar sus objetivos y resolver el problema y la muestra se seleccionó de manera intencional, donde el número de muestras (3) muestra del modelo total (24). Y diseñe la herramienta (formulario) y presente a los expertos para verificar su validez y alcanzar los objetivos.

La investigación alcanzó resultados, que incluyen:

1. La ornamentación geométrica en la clase base depende de la construcción de la red básica a la luz del espacio disponible y de acuerdo con las variaciones de repetición, armonía y equilibrio en el dibujo de unidades y vocabulario decorativo o la distribución de centros que generan El elemento decorativo en el centro de diseño o en el lateral.
2. La decoración arquitectónica y arquitectónica tiene una estructura matemática. La matemática es un sistema lógico y un diseño en las formaciones de ornamentos geométricos en la arquitectura islámica si la decoración es una forma completa de pensamiento matemático.

El investigador recomendó beneficiarse de sus hallazgos y vocabulario para mejorar y activar el plan de estudios de la decoración de ingeniería en general, en los departamentos pertinentes dentro de las facultades y los institutos técnicos. El investigador propuso un estudio de las características estéticas de formas y patrones arquitectónicos en la arquitectura islámica moderna en Irak.

### **Research Problem**

The Islamic world has known a great creativity in the field of decoration in general and in the field of geometric decoration especially. As the geometric decoration has given an effective Islamic character through the innovations of the Arab Muslim artist in this field in this area, the influence of the religious faith in the Islamic world is reflected in the social reality of the Islamic society. In fact, there has been a positive impact on the flourishing of the arts and the creation of many arts in all fields. The social reality of Muslims has been one of the most important cultural phenomena, and political, the phenomenon of Islamic revival . Which contributed to highlighting the various aspects of the various scientific, cultural and

artistic fields and even the Arab - Islamic heritage has become a major arts confounded for various social and technical sciences.

The geometric ornamentation depends mainly on the construction of the basic network in the light of the available space according to the variations of the output such as repetition, harmony and balance in the drawing of units or vocabulary or the distribution of the centers of the decorative element at the center of design or on its sides and then selecting the basic elements and employing them in that space and then the final output Which involves concepts based on the selection of castles through engineering connections for the final incorporation of the design. And through the researcher's knowledge of many decorative engineering variations, which depend on the diversity of all through the basic network on two basic elements are the box and the circle. And that the most researchers in this field have not been exposed to ways and how diversity in the decoration of engineering, although it is based on two elements or more in the process of installation and construction design, and through the analysis find that the possibility of development is required in the foundations and ratios of the constant change through the diversity of decorative form 0 Through the knowledge of the practical aspects in the process of engineering output and how to access and identify the basics of this art identified researcher problem by the following question:

What is the formal diversity of geometric designs?

#### Research Importance

The plant decoration is an artistic course of great importance in the Arab-Islamic heritage. It is a wide artistic field for research and study in many other technical fields in scientific research. Accordingly, the importance of this research lies in:

1. Reveals the artistic and design foundations employed in geometric decorative formations.
2. Contributes to the awareness of the intellectual and practical aspects of students of the Faculty of Fine Arts, especially the Department of Arabic calligraphy and decoration design students.
3. The Architectural Department of the Faculty of Engineering and Interior Design of Architecture.

#### Research Goals

The present research aims to reveal: (Formal diversity and the philosophy of the architectural unit of architectural designs).

#### Search limits

Objective: The decoration of the architectural designs of the Islamic archi-

ecture in Baghdad.

Spatial Limit: Baghdad City.

Limit Temporal: General (142 e-1440 e) (760 m-2019).

Terminology

1. Diversity

(Ibn Maswar) defines him as “more than sex,” which is also the multiplication of the thing, the diversity, the oscillation, and the diversity of the thing (2, p. 364). Riad defines it as “an antithetical order that involves the meaning of a variety of different types of visual elements and their different types” (17, p. 32).

The researcher defines procedural diversity as:

(The result of variation and congruence in the proportions of the structural elements of the geometric patterns of decoration, thus showing different morphological characteristics in a fixed space).

2. The Design:

Scott defined it as a creative work that defines its purpose (20, p. 5)

Abo defines it as a process characterized by geometric and decorative lines and shapes in the occupation of empty spaces for certain purposes, including decorative forms. The occupancy of space requires high technique and flair, and access to content in the closest and simplest way (27, p. 328).

The researcher can develop a procedural definition of design (Which is the organization of the relationships and the basic elements of the architectural decorative work through the foundations and standards of design to achieve the function and beauty with the unity of the intellectual subject to achieve technical output)

3. Decoration:

(Ornament, ornamentation), and then (all decorative ornamentation, and then a semi-abrasive forged and a house of a breach, decorated the house, decoration, decoration and complete) (2, p. 123)

And knew ( Jensen R. ): (As that it is not a structural and functional component, but something that is added to what is structural, or functional may be technically unhelpful yet has the purpose of making things beautiful) (51, p. 9) .

The (Janabi) knows: decoration or engraving in an artistic manner arranged in specific measurements, either by digging, drawing, In movable

or immovable objects for the benefit of public or private property such as buildings and buildings ( 12 , p. 134)

(My legs): the ornamental whose components consist of the modification of plant, geometric and linear forms to repeated units to decorate domes and doors of mosques (18, p. 6)

The researcher builds the definition of *sommelier* for decoration because it is consistent with the goals of his research .

#### 4. Engineering Decoration:

(Daoud): are the geometric structures that arise from the intersection of straight, uneven and propagable lines of geometry in all directions by repeating the basic geometrical unit on which each model of stellar and non-stellar models is constructed ( 14 , p. 9).

As defined by Salima: It is a form derived by the Arab Muslim artist from coordinated artistic formations to fill the space created by the absence of human images and to present them in artistic frameworks that are consistent with the nature of the materials used in works such as clay, stone, bricks, bone, metals, and wood (26, p. 3) .

As defined by (al-Alfi) as: Simple geometric elements and shapes such as triangles, squares, nerves, double spines, broken lines and interlocking lines ( 7 , p. 115 ).

The researcher adopts the definition of “David” because it is the most comprehensive expression of geometric decoration as it fits with the objectives of the researcher.

## Chapter Two

### Introduction to the emergence of decoration:

In the Arab Islamic civilization, the geometric motifs have assumed special importance and a unique personality that has often become the main element that covers large areas in a wide range of architectural and artistic fields due to the tendency of the Arab Muslim artist to tend to abstraction. Archaeologists also believe that decorative forms originated in ancient humans as a result of the many transformations they made in the forms of animals, plants and geometric forms, such as parallel and straight lines, consisting of decorative units built in different geometric formations (16, p. 29). Since the dawn of history, decorative arts exist and are rooted in man (20, p. 35). Their motives and aesthetic needs were behind them. They are a very old type of artistic human activity that appeared to be one of the oldest traces of plastic art (drawing and sculpting the first hunters) and is associated with the first its prosperity is closely related to the early



beginnings of the primitive craft.

On the other hand, the geometric motifs in the development process were the symbolic structure of the Arab Muslim artist and the satisfaction of the spiritual pain. The primitive man contemplates the chaos of the world around him with fear and suspicion, and his artistic effectiveness is impelled to establish another world of sensual cognitive values free of all tyranny of life. What was alive and authoritarian in his constant visual impressions of variability to fixed symbols of an abstract and intuitive type (62, p17). The primitive artist embellishes before he is designed, and the arousal of separate senses and associations of deity and richness precedes much attention to cognitive coherence in form. Thus, plastic arts begin with the ornate decoration and symbols, and the aesthetic pleasure of primordially returns to the richness of matter and the abundance of decoration (27, p116-117). The Muslim is unique in his geometrical imagination, which focuses on the mass, divides it and divides it into lines and curves, which are repeated, alternated and extended to infinity so that the viewer cannot determine its beginning or end (7, p. 129).

First: The Philosophy of Decoration in Amaria

The man used geometric motifs since prehistoric times as he painted before he could read and write. The decoration was synchronized with the presence of man. He embellished his things and all his buildings (29, p. 153). The primitive artist was embellished to distance himself from the feeling of fear of emptiness. (9, p. 13). The basic basis of the decoration is that it is based on the imagination of nature.

Natural draws emboss elements (28, p. 219) as well as architecture as its artistic work is also based on the standards and systems adopted by the College of Genesis (55, p101) and the man builds the system in the form of a plant or a paper, and then organizes the imagination to the basis of proportionality The concept of monotheism as a doctrine behind the use of the word “ The Muslim artist of geometric shapes and their organization (47, introduction) has been embodied in the designs of his compositions (36, p. 369) his belief that God created the universe according to the laws of sport (18, p. 31) and that he gave form, beauty and order to everything according to his own laws (35, p. 508), where he used (13, p. 30) Islamic art has developed these motifs to an astonishing extent (14, p. 105) and his works of art in Islamic architecture are an example of how he can use Mathematical systems and series of repeated numbers on the decorations and creation of the son (E 10, p. 33) which show his skill in organizing sports relations dimensions, sizes and shapes between objects (4, p. 130).



$$A \quad x_i(t) = x_i(t) + \beta_i r^{t-1} (x_i - x_i) + \alpha(\text{rand} - 0.5) \quad (9) \quad \text{is}$$

a

a cover of the architectural surfaces with its organized configuration, although its complexity and rich variety, p229), geometry is the solution to the problem of the system in the work of art is an essential part of free production (56, p11) and architecture is often tend to perfection engineering (37, p160) and perfect numerical mathematical subject (23, p. 22), and architectural and decorative form of complex and diverse You need a large number of different symbol systems to describe them (55, p57).

The architectural masterpiece is the basis of architecture (32, p. 131). The architectural decoration is of course related to the appearance of architecture, which is the beauty of its architecture (33, p. 47). Architectural and decorative form. The mathematical relationship dominates the construction of the part, even if it is a single form and also controls the structures that are organized through all the interrelated parts (34, p. 17). Mathematics is the common element between architecture and decoration (10, p. 42) two structural patterns have visual manifestations (35, p. 509).

The decorative and structural forms that are based on mathematical equations are highly functional in the most complex artistic productions, as they give them and give them a purpose and aesthetic meaning (5, pp. 55-56). Because mathematics deals with quantity, which aspects accept measurement and number (22, p. 30), they contribute effectively to access aesthetic beauty as it is reinforced in the quantitative organization of the shape more than what we find in its qualitative description (12, p. 67) and because the problem of shape in decoration and architecture is nature (55, p92), a substance of forms and the secret of its secret lies in the analysis of its structure governed by mathematics (8, pp. 52-53) and that all that is meaning and d in architecture and decoration comes from mathematics in choosing the appropriate dimensions And events (43, p304).

Second: Figure Engineering and Decoration Engineering Ammaria

The geometric shapes in the architecture are based on several design elements, the most prominent of which are elements of conceptual design - the visual elements of the formation of the geometric shape of the point, line, surface and mass. And the elements of practical design concentrated on several aspects, including the decorative expression, which may be realistic or model or abstract and on the symbolic and functional side with the goal of achieving two goals, an architectural goal to alleviate the burden of the transfer of architecture and the last decorative goal to communicate the idea of the technical theme For geometric ornamentation in a

dynamic style and an aesthetically pleasing aesthetic display (11, p. 33).  
For decorative elements of geometric shapes:

**1. Elements Relational of the shape Engineering:**

The construction of a body of any geometrical form means the entry of the element of form into the space element, each with its own characteristics and structural forces that conflict with other attributes or forces (24, pp. 36-37). Space and geometric form are essential elements in the design of architectural decoration. The basic space is characterized by forces of unity, (58, p16) as the relationship between them is the relationship of the displacement of the current and the substitution of the structure to explain its strength through the spatial relationship in the space areas between the border Pacific Ocean The space and the boundaries surrounding the shape (the space occupied by) according to the organization of the relational elements of the shape (position, direction, space, gravity). These elements control the spatial relations between the spaces of the geometric shape and the spaces of the base holding it or the container as a ground. Of the decorative geometric forms that enter the base space are its structural strength and at the same time be the origin of space domains charged with directed tension forces whose effects vary depending on the relationship of their position with the center space (41, p58-59). However, some relational elements are aware of the position, It is always associated with an element or a description of it because the direction of any decorative geometric shape depends on how it is linked to the sphere of the narration and to the basic space it contains or to other geometric shapes close to or adjacent to it or (60, p278-279) The position element of the shape is governed by its relation to the base space or its structure and the other two elements are space and gravity as each shape occupies space in the space of the base and this space may take two faces or be positive (busy) Or is negative (empty) and may also be flat or the body.

**2. Elements Conceptual - Visual of the shape Engineering.**

The conceptual elements of the body of any engineering form are not visible but are aware of a certain point at the angle of the shape and a line that determines its shape and the surface of its surroundings and its mass occupies a space (61, p7) and where the points, lines, surfaces and blocks of shapes are transformed into reality by visualizing them and Elements have realistic visual implications. The point element consists of the beginning and the end of a line or the intersection or convergence of lines in the geometric shape. The line element is a directional path of the movement of the point, which has a specific position in the shape of the shape. By which

n is determined States block shape and form paths surfaces mass which is determined by the number of surfaces and shape of each surface is made (flat) position in space

(61, p7-5) In the design of two dimensions of geometric shapes, its mass recognizes the perception of visual depth, which is visual illusion, and in the three dimensional designs embody and embody a physical nature which has a shape, size, color and texture. The visual elements of a body of any geometry are determined in the following

1. An item Shape: Which Determines identification the appearance of the shape.
2. An item Size: Explains Measurement Natural and relative for the body Figure.
3. An item Color: Adjective Featured of the shape About Surrounding.
4. An item Texture: Show Features Surface of forms The Be Surface Level or Decorative or Prominent as much as what. The Commission the shape Engineering Not Just Form Visible but rather she Form specific in size and color Texture (61, p7).

Third: The Shape Decorative and Their Transformations Engineering

The decorative forms give a reflection reflected in three aspects, the first of which is the elements themselves and the second is related to the arrangement of the elements and their composition, and the third is the meaning and effect of the shape of the images (10, p. 74).

(20, p. 74). The geometrical form of the building is mathematically constructed, requiring a mental activity that reveals its secrets and holds its strength and complexity to the ability of the Muslim artist to balance geometric shapes with the structure of straight lines and the structure of curved lines. The geometry of both straight and curved lines has a sense of mathematical beauty and the combination of the diversity of geometric shapes gives a fantastic aesthetic result (10, p. 83).

The shape of the decorative body is in a reciprocal relationship with the material and the artistic style used by the architectural decorator and his personal style in the exploitation, use and employment of materials, tools and tools in his accomplishment of the architectural decoration (10, p. 54). The geometric shape is a combination of the symbolic side and the practical aspect. The actual function of the geometric decoration can be satisfied with a wide range of geometrical shapes and architectural motifs (10, p. 68), such as the basic geometric forms of the architectural motifs such as

the circle, the square, the polygon and the triangle, (15, p. 77). Therefore, forms in Islamic decorative art are of great philosophical importance (10, p. 38).

The architectural work of these geometric forms is not something in itself but rather what it reveals and makes sense (50, p206). The Muslim architecture in the muqarnas, friezes and arches revealed its ability to give a decorative name to the architectural block (53, p136-137) (45, p83-84). The decorative form takes shape within the system of the relationship of the part and all. The decorative parts of the structure appear to be connected together in a way that the meaning in the whole or the meaning of the whole depends on the style connecting its parts (45, p67) and decorative construction

Engineering Complete from through Basic building techniques are:

1. Transportation The position of the form from one place to another form
2. Recycling a form j about the position or point fulcrum certain
3. Reflection of the shape of the symmetry catoptric
4. Alaqlab (heart) shape, and it repeated it's so corresponded about the axis of the medial him.

#### Fourth: The Relationship Spatial In the Form of Decorative Engineering

The relationship between the decorative elements is of great importance as the element is derived from its internal relations and thus all becomes more important than the parts (54, (p. 42, p. 42) and that these relationships are the ones that reached the purely formal beauty (15, p. 105). The most prominent ways of structural and organizational relations in the formation of architectural bodies are:

1. Self-centeredness of the form has no relation Insulation between Shapes separated by spatial small relatively as such in figure (1).
2. Relationship contact (seam): contact forms point one or Several Places without a comma space between them 0 as in Figure No. (2).
3. The overlay relationship makes a shape that covers part of another shape so that is being advanced format to me Top and back shape to me down. As such In Figure No. ( 3 )
4. The penetration relationship is the overlapping forms With Each other but clearly transparent and Lines Kavavhma remain visible entirely 0 as in Figure No. (4).
5. Autism (the Union): The form overlaps and forms one as it unites Lines Contour together 0 as in Fig. (5).

6. Relationship projection (subtraction) overlay forms one negative and another positive as that the part of the visual form covers a shape Non Visible. As such In Figure No. (6).

7. Cross relationship he is type of penetration between Two shapes and the part formed by the intersection he is Which is being Visible 0 as in Figure No. (7).



Figure(3)



Figure(2)



Figure(1)



Figure(6)



Figure(5)



Figure(4)



Figure(7)

Fifth: The structure and the system of architectural decoration

Each structure has a system and structure is only a system of relationships (34, p. 60), the structure that determines the relationships between elements and relationships are governed by laws and regulations constitute a transformative act and at the same time maintain the characteristics of the structure system and relations and transformation are the foundations on which the structure and structure (16, p. 57). The system is the essence of the Umayyad decorative art through which the Muslim artist controls the coordination of structural relations, both spatial and formal, and the events of correlations and consonants between decorative objects, whether they are shapes or colors The system expresses the harmony, consistency and functional integrity of the structural relationships between the vocabulary, which gives the sense of unity and sense of structure ( 39 , p28 ) , And the researcher believes that the decorative system Amari depends on three basic characteristics in general are:

1. Regularity: All geometric shapes have a specific shape and have a

beginning and an end and all parts are interconnected and connected to one another regularly (4, p. 42). Muslim artist was great than seeking to achieve through ideas or actions in the fickle world and multiplexer (4, p. 18) distinguishes in his artistic work to invest and exploit the regularity property as it was the beauty source in the decorative formations Ammaria that lie all in the geometric blocks of regular symmetry and type which added A second beauty on its decorative motifs (43, p).

2. Engineering properties: Each system has dimensions and these dimensions have geometric shapes and structures of forms and lines of engineering and the straight lines of geometric lines of the lines as the contour lines of geometric shapes such as triangle, square and rectangle as well as geometric curved lines are also from the lines of regular lines of geometric shapes such as the circle and their generators and derivatives Oval and oval.

3. The scale property: which indicates how shapes bodies perceive structural elements of architecture. There are two scales of the scale: a mathematical scale and a geometrical scale used in the Umayyad system, the natural scale measured by the size of the shape or space compared to other objects in an surrounding structure and another measure of the human scale The size of the ornamental element is measured by the dimensions and proportions of the normal human size (20, p. 28, 65).

The term Muslim neighborhoods on the intellectual and cultural expansion in the country , which was occupied, especially Transoxania and Andalus Muslim army and the transfer of the Arab- Muslim heritage of the country (for Abd al- Khaliq, Ferial Dawood Decoration ivory, Journal of Arab Horizons, v . 18, 1980)

Sixth: Types of structures used in the decoration of Umayyad

Among the most prominent structures used in architectural decoration designs Amari:

A. Formal structure: It is formed in the form of a network of straight orthogonal lines distributed in equal or horizontal and vertical intervals. The geometric shapes are organized according to the boundaries of these divisions. Their regularity and formal structure have several types:

1- The structure of the repetitive structure: In this pattern, the total area of the architectural decoration is divided into secondary subdivisions in the same form and measurement without adding gaps or spatial separations. The geometrical shapes are signed on a regular basis, each of which has an equal space (such as diagrams) 61, p25)

2- The structure of the hierarchical structure: In their configurations, the structure of the repetitive structure except structural divisions that change in shape and size or both in the pattern of successive (consecutive) (61, p. 39)

3 - Radial structure: It is a type of repetitive structures, but designed in a circular shape so that its structural lines revolve around a focal point.

B. Formal semi-structure: This structure is usually fairly regular but it is a pattern of irregularity and may or may not include structural lines to determine the order of decorative geometric shapes and have several patterns:

1. The pattern of similar structure: It is a structure that does not have the stability of the structure of repetition, but the similarities of each other (61, p. 33)

2. Central structure: In this style, bodies and decorative shapes are freely organized to achieve the effect of concentration from a point or line of preconceived construction in the urban design. The maximum density is crowded around that point or line. This is either regular or interchangeable, (61, p51).

Seventh: Foundations agree Levels Design of the Surface Decorative Amari

The roof Decorative Amari Based in a Its construction On Property Quality ore Display Decorative Built or Construction ( wages - bricks - plaster - stones ) and property Processing Basic Of the subject Technical Decorative Engineering And dimensions Its surface and this is The pillars Two factors Arbitrators in a Process the design Decorative Amari For the body Configuration Material And semantic And aesthetic Theme Decoration Engineering The Complete Processing On body cut Fragmented or On body Surfaces or On body Sculpture in a Surfaces Interfaces Of the building or Walls or Columns or Hoops or Roofs Including Proportional to It fits With Characteristics Physical And chemical And mechanical As well as About that There Standard Environment Which Regards Quality the place Custom Of the surface Decorative And its surroundings Environment Natural And this the problems Cares about By Designer Decorative Amari Before Construction And processing For components And elements structure the roof Decorative Engineering ( 55 , P4-10 ) And structure Established On principle Compatibility between Levels the design The three Mentioned above In particular group Characteristics Space Basic :

1. Property Proportionality: Which to her Role Important in a Process Coherence between Target Career Purpose The aesthetic Of the surface Decorative Amari The designer Treat Degrees Descent between Section



And all It regulates relations between Dimensions Space Surface Decoration And elements Ingredients Structure Decorative Proportionality One Aspects Aesthetics Which appear perfect Design the roof Decorative in a Processing relations Volume And the area And degrees Rhythm Of forms And spaces ( P65 , 55 ) .

2. Property Scale: For these Property Impact Great in a group all relations Formality And space for every Ingredients the roof Decorative Amari As in it Organize Designer Relationship between size Space the roof Decorative And its structure within field Space Building And space His field Visual And so on Follow Alone the scale Control between Spaces Building Himself And spaces Vision To form the roof Decorative He plays Role the scale Human And engineering in a Process Treatment Construction And decorative Engineering From Hand Comparison Greatness And small Of forms And degree Measured And clarity For the viewer for every From Elements Building And elements Decoration Frames Size Human in a the scale Indicates In a manner Especially to me size The thing Analogy to me Thing standard a favour or it's a Realize For standard And its complications in a setting Measurement the size And its relationship Vision ( 5 , P. 44) .

3. Property Closing: As Cares about Designer Decorative Items Physical (natural) space Building and containments Interlaced between Elements Physical For the body and structure the roof Decorative Amari with Scene While Regards Barriers in an Obstruction Privacy the movement And function (31, P. 18)

Eighth: Relationships Building Decorative Amari

That Form or an item emboss geometric What he is One And when Repeated or Multiply Number in a Configuration Decorative It is turns up to me Numerical Quantity Animated ( 5 , P . 46) Thus ,Loses Some Its characteristics Formality And quality Nor Be for him Property Numerical Balanced Except From Through His presence in a Relationship Numerical Like Symmetry or Repetition And so on is being Part One in a Multiple From Shapes Similar for him And from Featured relations Used in a Building the shape Decorative Which Divide In numerical terms:

1. Symmetry:

Prepare Element Organized Space And substantially in a Decoration Islamic (47, P53) Aims from him Grant Configuration Thematic Decorative Bezel Consistency Parts Consistency Skill fully Metzna (5, P. 85) and symmetry principle The idea Decorative Related group (High 58, P54) He is Achieves Unit And balance Full Parts Asymmetric ( 40 , P46 ) And sym-

metry a tool Of the unit And foundation Which The on her Applied in a the work Technical ( 57 , P76-77 ) And symmetry in a the place he is structure Numerical ( 52 , P353 ) It is Forms Symmetry Used in a Decoration :

1. Symmetry Sidebar Which Highlights As a case first Of the idea Engineering For analogy And many His appearance in a Tapes Decorative So it is In writing Directly or is being Style To organizes pace Decorated On Ends Axis Medically .

2. Symmetry Radiology Regular or what launch on him In turn As Arrange in it Parts about Point Centralized It can Repeat it About points Multiple Distributed On the roof Decorative They represent him Full. So Prepare Symmetry Surface No Directly and symmetry Located in a Decoration he is symmetry static Non Motor (19, Pp. 65-66).

## 2. Repetition

He is One means the mission in a Action the artist Decorator Muslim And practical Repetition No Means By Matching Complete Of the shape or Element Engineering or Unit Decorative But rather Also The same or Comparison By attributes Repetition in a Decorations Engineering Uses To restart Tightening or emphasis Element or the shape or Unit Decorative Once Tally Other in a style decorative Featured in the work Technical (61, P15) And repetition three Species:

1. Repetition Full : Repeat the shape or Element Engineering All His qualities Formality And standard At a pace one But Different By far One he is position the shape or Element Frequent in aSpace the work Technical 0

2. Repetition Altruistic (variable): repeats the shape or Element Engineering All His qualities Formality And standard But Non Matching For one Aspects in it

3. Repetition Rhythmic: repeats the shape or Element Engineering Frequency organization and at a pace Rhythmic Harmonious Create Pattern Decorative In line (3, S18-23) (49, P71-73)

Repetition Formula Basic And relationship Mission adoption on her System Decorative Ammaria Produce From movement Element or the shape or Unit Decorative , Repetition he is phenomenon Numerical ( 54 , P94 ) He is From Formulas Decorative Continuous (33, P. 64) and repetition Creates Rhythm, And rhythm he is Diversity Regular Changes ( 46 , P148-150 ) , as such that Rhythm Indicates to me Property Relational Relay (54, P125) He is for him Importance Extreme Especially in a designs Decorations Engineering Ammaria As Give The building Outlet For sources Unconscious Mission ( 5 ,P. 53).

Ninth: aesthetic Configuration Decorative Engineering Amari

The roof Decorative Engineering Built or Place Bai From Systems Architecture for him Grammar And signs Construction Grounded in a Its basics On Mathematics And engineering Special with it Which RFID With Techniques Designer Decorative Amari Which Provides With them an item Balance between parts Design the roof Decorative Amari . In relationships Sports between Dimensions Functional For the body the roof Decorative And space Structure the college she Systems Proportionality Which Twins between Dimensions Elements Construction The three Length , Display , Height in which Linked In percentages With Some of them Some As Be Interrelated Proportionately in a Space Which Operate it And space Which Formed Meaning else that What get up with it this is relations Proportionality he is Create System unification between pluralism Elements And shapes And so on By making Each Parts Belong to me The same Attributes itself And so on Be Sense System between Elements in a Building Visual ( P298, 38 ) .

Most Forms Surfaces Decorative Engineering Ammaria the beautiful As for that Be In a manner A rectangle or Square or Circle or Half Circle Wan Aesthetics Came From harmony the shape Total For the body the roof Decorative in a His relations With Parts As well harmony Parts in a Relations With Some of them In percentages And so on using Systems Proportionality or Generated From rootpreparation Which From Through Its consoles Sports And engineering Stand out establish Beauty in a Organization And symmetry And unity Homogeneity ( 31 , P . 124-140 ) , as that Beauty Formal For the body the roof Decorative Amari Indicates to me How to put Building Structure With this The foundations Sports And engineering Which Complete Dealing By From Before Designer Decorative Amari in a Design Shapes Engineering And organization Spaces Relations Aesthetics Like the rhythm And harmony And symmetry And contrast And order Cohesion ( 44 , P63 ) And these relations Aesthetics Prepare Based Basis in a group relations Aesthetics Of forms Decorative Engineering And for women the roof Decorative Amari 0 Total Decoration Engineering Ammaria Stems From The properties the shape And extent Its construction in a the roof Decorative Represented in a Property proportionality And layout And order Forms Engineering Decorative Like the circle or Square And the rectangle Polygons RegularVary Variety relations Proportionality between Dimensions ( 42 , P183-184 ) Add to me that The Perception Sample Structural For these Shapes Engineering is being From Through Elements Surface And their relations And their characteristics .

that Building Visual For these Models Structuralism For surfaces Decorative Engineering Ammaria Requires principle Whatever else addition to me What Male in a the system Structural To build As well as About principle proportionality Except and he principle the scale Which Use it Designer Decorative Amari in a Processing Measurement Sizes Of forms Engineering For Of elements Construction Other For all Surface decorative Amari Scale a certain The is being for him More From Scale One It is used Designer Decorative Amari Two styles or Two formats From the scale in a build up body the roof Decorative Engineering The former the scale Natural General Which Measured with it size Elements The builder of or The space Rate to me Elements Other in a structure Surrounding And scale else , the scale Human Which Previously Mentioned Which Measured with it size Element Structural or The space in a inside structure the roof Decorative Amari Rate to me Dimensions And fit size Human Natural (42 , P297-298 )

So We find Designers Ornaments The Amariites Muslims They excelled using These two Principles And they promised them Also Promoters Aesthetic From Accessories the design Structural For decoration Ammaria Both Mass And construction In rhythms proportionality may They gave relations Right between All And part And they made Rhythm Proportionality Element Building in an engineering relations Formality inside structure Of the surface Decorative Amari Structure As Ammaria 0 It was Complete Coordinate Descent In a manner rhythmic regular Of elements In space And distance With a view events Balance in a all Status Elements Formative Of the shape Decorative And perfection Configuration Total Of the surface Decorative Amari Because Form formation Commission Decorative Give Signal Reflected From Through Elements Construction Itself And from Arrange And installation With Some of them , As well From Through Effect that the shape in a Scene Spatial And space For the beholder ( 4 , P. 23) as that Sizes And events Elements Construction For the body And structure the roof Decorative Linked directly With mission And jobs Construction And architectural Of the building Decorator Which It is possible that Be Indicators Visual For size And scale And spaces ( 59 , P73 )

Styles Decorative Engineering in a the design Islamic and the idea Repetition Units

Must From Signal Firstly to me it's a No There are Verse document an old Survived (resisted Courtyard) to guide us to me theory Uses Engineering in the art Islamic. and on Though From that There Others They

tried Describe formation Established That Styles The Their work she was Characterized Not Perfect And justifications Non Convincing 0 and His face We looked The That Business Do not principles the basic On What We will call it Later Alone Repetition in a the design Use Frequent For configurations Engineering he is Which is being the design Total. In the world Islamic Today The Craftsmen Whose They practice Making Styles Engineering Implemented On the wood And ceramics And marrow Minerals ... etc ... they Are using That Tools Traditional Component From The men And ruler, And this Roads Engineering may Use And developed I was convinced From Before People in a the past Non Are known And this Tools did not Prepare able On innovation Patterns And designs New But get up Return Production Styles Old.

#### Previous studies

The importance of previous studies as a scientific support for research through the use of its methodology and determine some of its procedures or methods, as well as statistical means and identify the sources related to research and knowledge of the findings reached by researchers in their research. In spite of the many historical and analytical studies of the subject of decoration and geometric decoration, the researcher has developed four historical studies and three descriptive analytical, related to the field of research, but these studies reported research in some of its procedures only.

The following is an introduction to these studies:

#### 1. Study (sound) (technical assets of the decoration of the Abbasid palace in Baghdad) 1980(1)

The aim of this study was to identify the technical assets of the geometric, vegetative and linear decoration on the walls of the Abbasid palace. The aim was also to find out the effect on the use of these units and their historical and intellectual depth in the Mesopotamian civilization, especially in Baghdad, the capital of the Abbasid state.

An analytical and descriptive study that resulted in a number of results, the most important of which are:

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(1) Abdul Rasool, Salima, The Artistic Assets of the Decorations of the Abbasid Palace, Baghdad, Ministry of Culture and Information, General Establishment of Antiquities and Heritage, 1984.

1. The most prominent characteristic of the building of the Abbasid palace is the decoration of the reward, so that it seems that the main importance in the Islamic establishments is based on this decoration.

2. The decorative works are concentrated in the Abbasid palace in the main building units such as the Iwan and the entrance hall, as well as the muqarnas, which are concentrated on the ceilings and columns of the surrounding galleries in the square.

2. Hamid study (architectural decorations) 1985(2)

The study aimed at dealing with the subject of architectural decorations in buildings and religious and civil buildings. It is a purely historical study. It examined the priorities and reached the sources of its development, its origins and the extent of its influence and influence in previous and subsequent methods.

The study divided the architectural motifs into three levels or axes. The first dealt with decoration in the plaster and the second decoration in marble.

Has resulted in a number of results, including:

First: Plaster Decoration:

1. The decoration of the building throughout the successive ages was a prominent place among the ancient Iraqis who were without a doubt pioneers in art and we have reached buildings adorned with decorations, some of which date back to the fourth millennium BC

2. In the Umayyad era, the demand for building decorations increased significantly, and there is no longer any great embarrassment even in the decoration of the mosque .

3. Study of David (The technical foundations of wall decoration in the Mustansiriya school) 1989(3)

The aim of the thesis is to address the subject of the architectural, vegetative and linear wall decorations in the Mustansiriya school, because it represented the maximum degree reached by the Arab ranch in the wage 0

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(2)Hamid, Abdul Aziz, the architectural decoration, research in the Encyclopedia of Civilization of Iraq, C 9, the House of Freedom Printing 1985.

(3)Daoud, Abdul Ridha Bahia, The Technical Foundations of Wall Decor in Mustansiriya School, unpublished Master Thesis, Faculty of Fine Arts, Baghdad University, 1998.

in the knowledge and high skill in the field of design, innovation, construction and distribution of decorative configurations calculated proportions, The progress and development in the field of decorative arts in the seventh century AH 0 especially in the area of pay and its characteristics as a qualified and adapted to various applications.

It is a descriptive and analytical study and was determined by the frescoes of the Mustansiriyah School, both on the outer walls or on the inside and inside the walls of the roofs of the Owen. The research community was 887, distributed on 122 plates.

An analytical descriptive study has resulted in a number of results:

1. The diversity of elements and units of engineering and plant both inside and outside, as the Arab Muslim artist tries to collect all these elements in one style or composition.
2. Blending and overlapping of geometric units such as octagon, pistol and pentagon with each other and on the interior spaces, including the vegetal and floral motifs, especially the forms executed with the prominent drilling.

### Chapter Third (Procedures)

Follow on researcher Approach Descriptive Analysis to achieve Goals Research from through Analytical Samples actress for properties the assemblies the original from Decorations Engineering in an Architecture Islamic Organization - Baghdad.

Community Search:

Locate Community search in forms Decorative Engineering and their variants Multiple as Represent Number Forms the society the original Search B (24) form Decorative Geometrically.

A sample Search:

Done Selection a sample search in a manner Selection My Story Will Analyzed as Their number (3) sample Represent Forms for units Decorative Geometric Respond for properties the society Which Check Goals Search.

Methods of collecting information:

1. Government and private libraries, including personal libraries.
2. Letters and university papers and scientific sources of competence.
3. Imagers Al foto research community graver.
4. Previous studies completed and published.
5. Experience of the researcher.



### Search Tool:

In order to achieve the objectives of the research, the researcher designed his research tool (analysis form), which included the theoretical framework and opinions of expert experts (\*) According to multiple axes in order to achieve the research objectives.

### Tool Validation:

The researcher presented the tool (analysis form) to the experts(\*\*) to demonstrate the validity of the tool and its comprehensiveness to achieve the objectives of the research through their scientific observations.

### Stability:

Check consistency(\*\*\*) which represents objective research purposes for reaching desired results through the adoption of analysts (\*\*\*\*). The proportion of the agreement as follows:

1. Ratio of the first analyst agreement with the researcher 90%.
2. Ratio of the second analyst agreement with the researcher 90%.

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#### \* Experts are:

1. Dr. Abdul Moneim Khairi Hussein/ retired teacher at the Faculty of Fine Arts/ University of Baghdad.
2. M. Dr. Jamal Hassan Ali Al-Attabi/ Teaching at the Institute of Arab History and Scientific Heritage.
3. M. Dr. Jawad Mattar Al-Musawi/ Teaching at the College of Education/ University of Baghdad.

#### \*\* Experts themselves.

\*\*\*Percentage of agreement = Number of times of agreement × Number of times of disagreement × 100 number of times agreed.

#### \*\*\*\* Analysts they are:

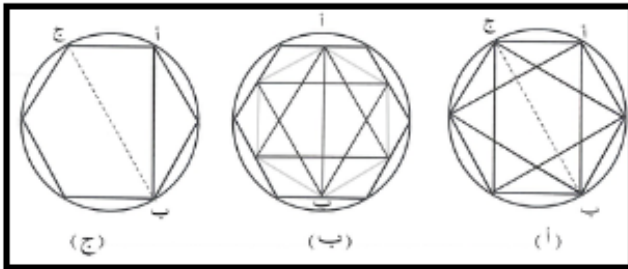
1. A. M. Dr Hesham Slave Curtain/ Teaching retired in a College Arts Beautiful / University Baghdad
2. A. M. Dr Jawad rain Supervisor Moussawi/ Teaching in a College Education / University Baghdad.

The Fourth Chapter

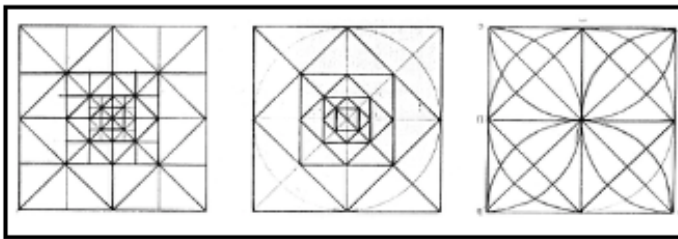
Sampling analysis:

We find that the decorative works in Islamic architecture are based on three mathematical systems:

1/ proportional system based on (2 square root) of geometric shapes and regular ribs Kalmrba rectangle and Mdilathma engineering derived Kalmtmn and its complications, as in Figure (8: 9).



Figure(8)



Figure(9)

2/ system proportionality Building On the (box Root 3) and forms Engineering Regular Ribs Like triangles Polygons Engineering Derivative Of which Like a pistol and its complications as such in a Figure (10).

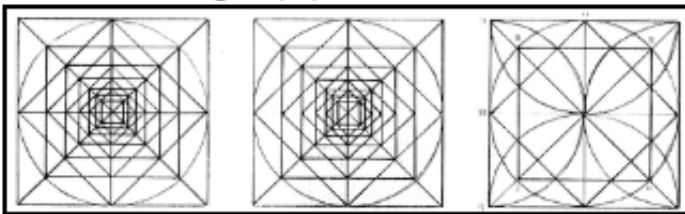


Figure (10)

3/ system Tens of thousands Building on Al-Qaeda Gold or Sector Golden And for all Shapes Engineering And derivatives from the formula Sports as such in a Figure (11).

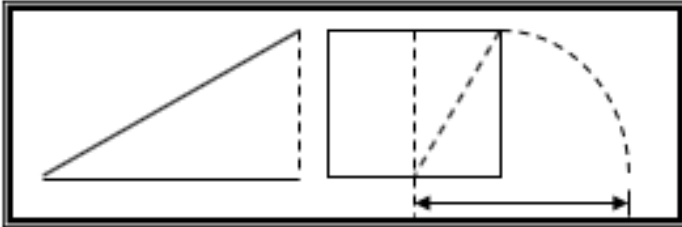


Figure (11)

And take Forms From Patterns Bodies like style Radiology And central And staphylococcus And Shabiki Style Linear And from that Enable researcher in a Determination The most important Categories the basic For variations Formality Decorative Engineering in a Configurations this is Patterns:

1- Category Shapes Engineering Basically:

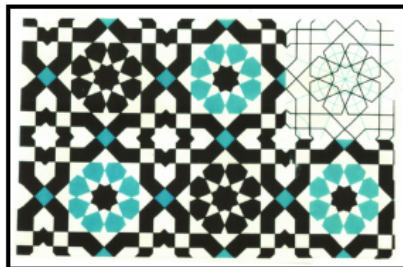
It is Shapes Regular Relations Engineering and fixed and harmonious by the sight Which Done Identified System Formal For the two units the ornaments Engineering the two Form Circle Form Box.

2- Category Shapes Engineering Secondary:

Which Shapes Free and the vehicle Regular and not Regular and derivatives From Forms Product the first and the result or Generated From System Repetition Of the shape Engineering As forms Polygons Different Types And measurement.

Sample No. (1)

Formal variations Eight-pointed stars, irregular pentagonal polygons and intersect crosses.

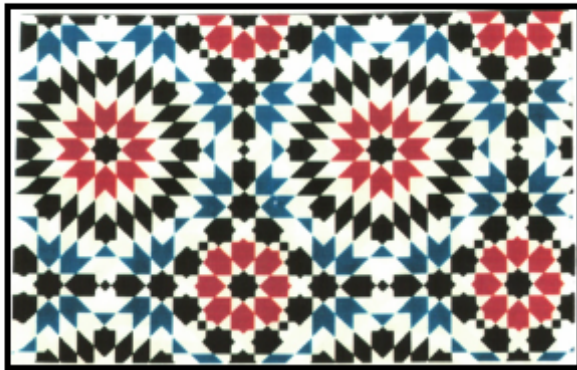


The structure of the decorative structure: a grid of squares and a network of triangles with equal sides and angles

1. The geometric shape of the decorative unit: square shape.
2. Pattern of repetition of the decorative unit: Repetitive formality of the eight stellar shapes , polygons and crosses
3. System of structural relations of the basic decorative unit: overlap and penetration of square shapes.
4. Proportional system: Proportion of root
5. System of space organization: linear network body.
6. A variation of shape and earth: the shapes of the eight stars are white and black and the cross crosses are black, white and blue, irregular polygons are blue and black.

**Sample No. (2)**

**Variations of radial stellar pattern shapes.**



1. The structure of the decorative configuration: a double mesh of squares with two different scales, one of which is equal to the half-ribs of the refined square and the other side is a tulip that leaves a space separator between them, which is the court in the composition of the composition.
2. The geometric shape of the decorative unit: square shape.
3. Pattern of repetition of the decorative unit: repetitive formative and hierarchical class.
4. System of structural relations of the decorative unit of the basic: overlap and overlap between the units of refined form.
5. Proportional: ratios of the root system.
6. System of space organization: a central and radiological body.
7. A contrast property of the shape and the ground: the ground is white, the stars are black and the regular and irregular polygonal shapes

surrounding the stars are triples of black, blue and red.

**Sample No. (3)**

**The shapes of the ten-pointed star.**



1. The structure of the decorative formation: A network of ten-sided polygons touching four sides and a secondary grid built from points centers in ribs of the first grid, where the lines intersect at angle 72 and expand into the interior of the star formation.
2. Geometric shape of the decorative unit: Regular polygon with ten ribs.
3. Pattern of repetition of decorative unit: repetitive and sequential repetition.
4. System of structural relations of the basic decorative unit: contact four sides of refined form units (The polygon).
5. Proportional system: Golden intersection ratio.
6. System of space organization: a network of polygons.
7. A contrast property of the shape and the ground: the five-pointed polygons, the orange star, the quaternary polygons in blue and the contour lines of geometric shapes in black and white.

**Results**

1. The decoration of architecture and architecture has a mathematical structure. Mathematics is a logical system and layout in the formations of geometric decoration in Islamic architecture if decoration is a complete form of mathematical thought.
2. The Islamic geometric decoration took its architectural and artistic fields to an astonishing extent, which helped to develop it as a symbolic

structure in its geometric or abstract units.

3. The geometric decoration in the base class depends on the construction of the basic network in the light of available space and according to the variations of repetition, harmony and balance in the drawing of units and vocabulary or the distribution of centers producing the decorative item in the center of design or sideways.

4. Formal Engineering Variations in Architectural Formations Based on two basic elements of engineering units and units, the shape of the square and the shape of the circle.

5. The element of mathematics was the main link in the principle of organizing engineering decoration Engineering and number was linked to the essence of the message of unity and the number one is the intellectual symbol of the origin of the universe.

6. The decorative forms of architecture in the Islamic architecture give a reference reflected in three aspects, including the formal elements itself, and the second is related to the order of the formal elements and their composition in the decorative and the third, the meaning and the extent of the effect of the decorative composition at the level of all.

7. The decorative artwork of the diversity of geometric shapes was not something in itself, but it makes sense, as it is not limited to covering the surfaces, but also helps in the conversion of space.

8. Architectural decorative construction in architecture was done through the basic techniques can produce a variety of decorative forms and more complex, notably the technology of transport, recycling technology, and the technology of reflection, and technology of the heart.

9. The variety of forms of geometric decoration in Islamic architecture through the system of fabric formal relations at the level of part or all and these relationships are the purely formal beauty.

10. The designer used decorative engineering several ways of structural relations in the formation of decorative art topics of functional and aesthetic significance and spatial effects and depth in the spaces of architecture or Islamic building.

### Recommendations

1. A comparative study showing the effect of the diversity of structures and spatial organization on the properties of the formal elements of decorative units.

2. Evaluation of the genetic diversity of the architectural motifs in Islamic architecture in the estimation of the aesthetic values of the decorative

formations related to the formal characteristics of the decorative elements square base and circle.

3. The effect of the decorative color diversity of decorative shapes and lines in the architectural decorative formations in Islamic architecture and its functional and aesthetic performance.

Proposals

Studying the specificity of each geometric form and the dimensions of building and organizing its formal elements and reconstructing them at the level of the visual, natural, and human scale in modern Islamic architecture compared to the decorative heritage.

## References

The Holy Quran

1. Ibrahim, Abdul Baqi: Islamic perspective of the theory of architecture, Center for Planning and Architectural Studies, Dar Maaref, Cairo, 1979. 0
2. Ibn Manzoor, the Arab tongue, Dar Sader, Beirut, C 12
3. Asadi Ghaleb Hussain: Decoration in Islamic Architecture, a Study in the Mathematics of the Ornamental Pattern, Unpublished Master Thesis, Faculty of Engineering, University of Baghdad, 1990.
4. Ismail, Ezz El-Din, Art and Man, Dar Al-Qalam, Beirut, 1974
5. Ashenfeller, Asweller, the Degradation of Western Civilization, Translated by Ahmed Al-Shaibani, the Library of Life, Beirut, 1964.
6. Al-Adhami, Khalid Khalil Hamoudi, Wall Decoration in the Monuments of Baghdad, Dar Al-Rasheed Publishing, 1983
7. Al-Alfi, Abu Saleh: Islamic Art and its Philosophy, Dar al-Maaref Cairo, 1996
8. Bachlar, Gaston: The New Scientific Thought, translated by Adel Al-Awa, Ministry of Culture, Tourism and National Guidance, Damascus, 1969
9. Bhansi, Afif: The aesthetic of Arab art, the National Council for Culture, Arts and Literature, Kuwait, 1969
10. Modern Art in the Arab Countries, Dar Al-Janoub Publishing, UNESCO, 1980
11. Biage, Jean: Structuralism, Translation: Aref Menemniyeh and



Bashir Opry, Oydat Publications, Beirut, 1971

12. Al-Janabi, Kazim, Baghdad School of Decoration, Journal of Heritage and Civilization, No. 14, 1991

13. Hamid, Abdul Aziz, the architectural decoration, research in the Encyclopedia of Civilization of Iraq, C 9, the House of Freedom Printing 1985.

14. Al-Haidari, Sanaa Shatee: Affiliation in the communities of unpublished doctoral dissertation, Department of Architecture, University of Technology, 1996.

15. Daoud, Abdul Ridha Bahia: the technical foundations of the decoration in the school Mustansiriya, unpublished Master, Faculty of Fine Arts, University of Baghdad, 1989

16. Rayser, Dolph: Between Art and Science, translated by: Dr. Salman al-Wasiti Dar al-Ma'mun, Baghdad, 1986

17. Russell, Bertrand: Introduction to Mathematical Philosophy, translated by: Mohamed Moussa Ahmed, Foundation of the Register of Arabs, Cairo, 1962

18. Riad, Abdel-Fattah: Composition in Fine Arts, Dar al-Nahda al-Arabiya, Cairo, 1987

19. Shaqi, Hussain Mohamed Ali: Decorative Units in the City of Baghdad mosques and their Possibility to Use in Hand Shapes, Unpublished Master Thesis, Faculty of Fine Arts, Baghdad University, 1998

20. Syriacui, Mohamed Ahmed Mustafa: Mathematical approach between logic and intuition Dar al-Thaqafa, Cairo, 1982

21. Scott, Robert Gillam: Foundations of Design, Dar Nahdet Misr for Printing and Publishing, Cairo, 1980

22. Shafei, Farid: Arab Architecture in Islamic Egypt, Egyptian General Book Organization, Egypt, 1970

23. Tariq Mustafa Abu Bakr: Structural Relationships Symbols in the designs of Sudanese paper currencies, unpublished doctoral dissertation Faculty of Fine Arts, University of Baghdad, 2002

24. Talo, Mohiuddin, Islamic Decoration, Damascus Publishing House, 2000

25. Abdul Amir, Sam Kamel. "Methods of Designing Plant Decorations in the Facades of the Abbasid Hadara", Master Thesis, Baghdad University, Faculty of Fine Arts, 2003.

26. Abdul Khaliq, Faryal Dawood, ivory decoration, Afaq Arabia magazine, p. 18, 1980

27. Abdul Rasool, Salima: The artistic assets of the decorations of the

Abbasid palace, Ministry of Culture and Information, General Establishment of Antiquities and Heritage

28. Abbou, Faraj: Elements of Art, College of Fine Arts, University of Baghdad, 1982
29. Okasha, Tharwat: Islamic Photography between Urban and Open, Journal of the World of Thought, Volume 2, Kuwait 1975
30. Fischer, Ernst: The Need for Art, translated by: Asaad Halia, Egyptian General Book Authority, 1971
31. Kubler, George: Anthropology of Humanities, translated by: Abdel Malik Al-Nashif, National Foundation for Printing and Publishing, Beirut 1965
32. Lobna, Asaad Abdul Razzaq: Design Basis for Street Furniture in Baghdad City, unpublished PhD thesis, Department of Industrial Design, Faculty of Fine Arts, Baghdad University, 1999
33. Lucor Bouzier: A Lesson in Architecture, translated by Suad Abdel Mehdi Afaq Arab Magazine, No. 3, 1984
34. Marzouki, Abu Yarub: Ancient Mathematics and the Theory of Science and Philosophy, Tunisian Publishing House, 1985
35. Hoyg, René: The Art of Tawila and Sabila, Translated by: Salah Barmada, Ministry of Culture and National Guidance, C1-2, Damascus, 1978
36. Head, White: Introduction to Mathematics, Translated by: Mohiuddin Yousef Al-Abla Printing and Publishing Company, Baghdad, 1952
37. Young, Carl Gustav and a group of scientists: Human and its symbols Translated by: Samir Ali, House of Cultural Affairs, Baghdad, 1984.
38. Arnheim, R. , : Visual thinking , University of Colifornia press , Ltd. , London , 1968
39. The Dynamic of Archetetural Form , University of Colifornia press , ltd . , London , 1977
40. The split and structure , University of Colifornia press , ltd London , 1996
41. Black well , w. , : Geometry in Architecture , John wiley and sons , Inc. , u.s.a , 1984.
42. Borissavlievitch , M., : the Golden Number and scientifics of Architecture , London , 1958.
43. Ching , F., : Architecture form , space , ordervan Norstrand Reinhold , London , 1979.
44. Chmnlizkij , S. , : Method of construction Geometric Ornamented systems in Alhambro Muqarnas , Annual of Islamic Art and Architec-

ture vol. , 6 , 1989

45. Comez , Al. , : Architecture and Crisis of Modern science the mit press , Cambridge , u.s.a , 1990
46. Derek ,H, and Oley , G. , : Islamic Architecture and its Decoration , farber and farber , London , 1964.
47. Dewey , J. , : Art as Experience , aapricorn Books , New York , 1958.
48. Elsaid I. , and Ayse , p. , : Geometric concepts , world of islam festival publishing co. , Ltd. , London , 1976.
49. Ghyka , M. , : the Geometry of Art and life , sheed and world , new york 1962.
50. Gombrich , E. H. , : the sense of Order , Astudy in the psy chology of Decorative Art , cornell University press , Ithaca, new york , 1909.
51. Graber , O. , : the formation of Islamic Art , new Haven , London , 1973.
52. Jensen R. , and Conway , p. , : Ornamentalism , Clarkson N. patter , Inc. , new york , 1982.
53. koptsik , v.A. , : symmetry in science and Art , plenum press , new york , 1977.
54. Le corburier , : the Modulor , part 1 , translated by petter De franca and Anne Bostos , faber and faber Ltd. , London .
55. March , L. , and Steadman , p. , : the Geometry of Environment , Methuen and co. , Ltd . , Canada, 1971.
56. Norberg – schulz: Intension in Architecture, Universitets for laget , Roma , 1963.
57. Outdoor Adrertising Association of Americo Ine., plant operation Guide , Lines sign , structure , Fall , 1998 .
58. Pedoe, D.,:Geometry and Liberal Art, penguin Book ,1976 .
59. Santayana, G, The sense of Beauty, collier Book, new york , 1961.
60. Saumarez , M , The Dynamics of Visual from , lewis , J , ed , van nostrand Reeinold , 1964 .
61. Scenic America. Billboard An Action Guide for citzen and public official , 1999.
62. scott, G , The Arhitecture of Humanism ,Methuen , London , 1961.
63. Wong, W, principles of two Dimen sional Dessign , new york , 1972.
64. Worringer, W, Form in Gothic , London , 1957.



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