Tishk International university
Interior design department
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FORM, SPACE & ORDER

Form

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Form

“Architectural form is the point of contact between mass and space … Architectural forms, textures, materials, modulation of light and shade, color, all combine to inject a quality or spirit that articulates space.

The quality of the architecture will be determined by the skill of the designer in using and relating these elements, both in the interior spaces and in the spaces around buildings.”

Edmund N. Bacon 1974

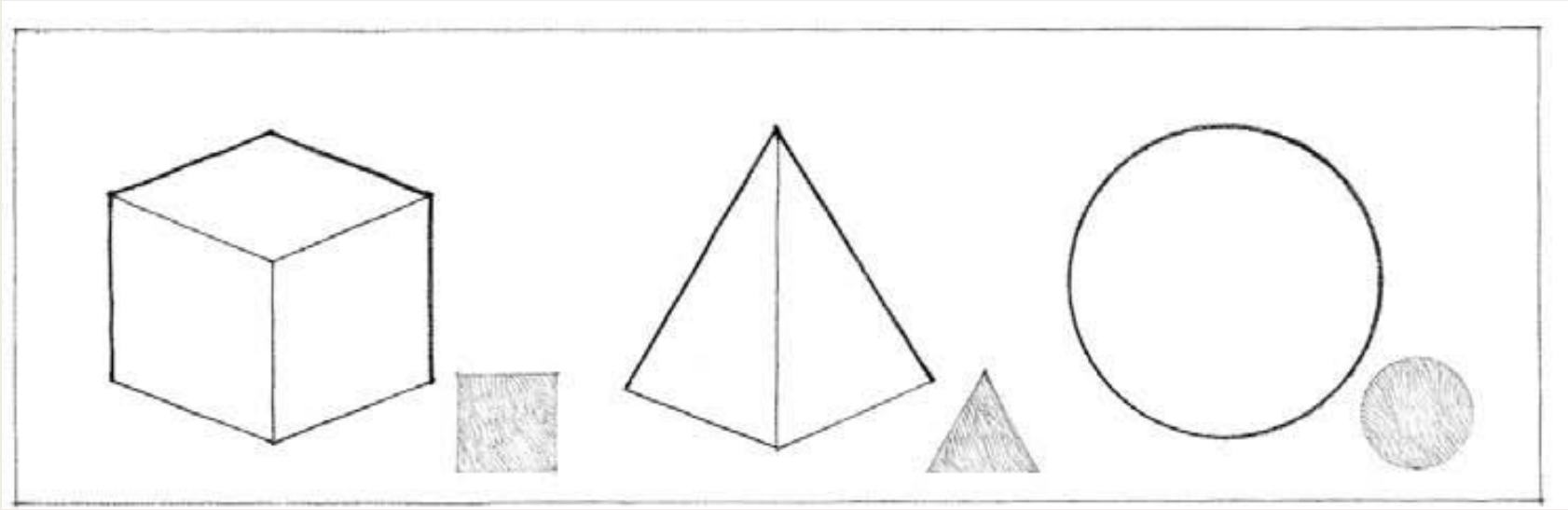
FORM

Form is an inclusive term that has several meanings.

- It may refer to an external appearance that can be recognized, as that of a chair or the human body that sits in it.
- In art and design, we often use the term to denote the formal structure of a work—the manner of arranging and coordinating the elements and parts of a composition so as to produce a coherent image.

Shape

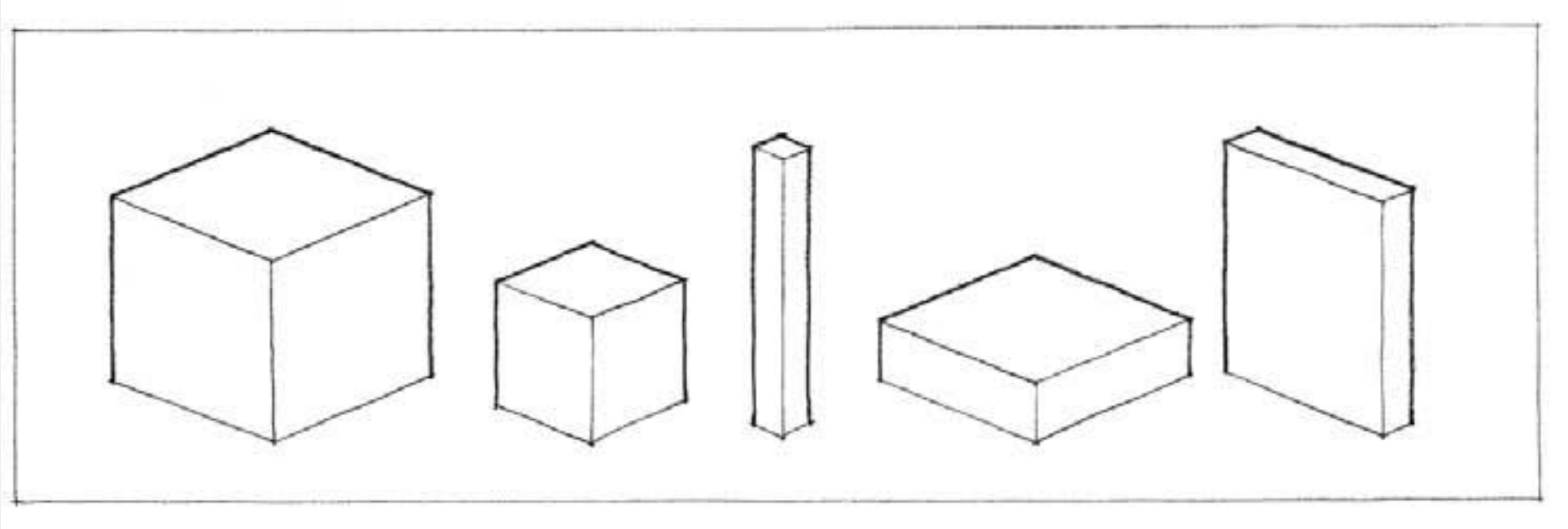
- The characteristic outline or surface configuration of a particular form.
- Shape is the principal aspect by which we identify and categorize forms.



In addition to shape, forms have visual properties of:

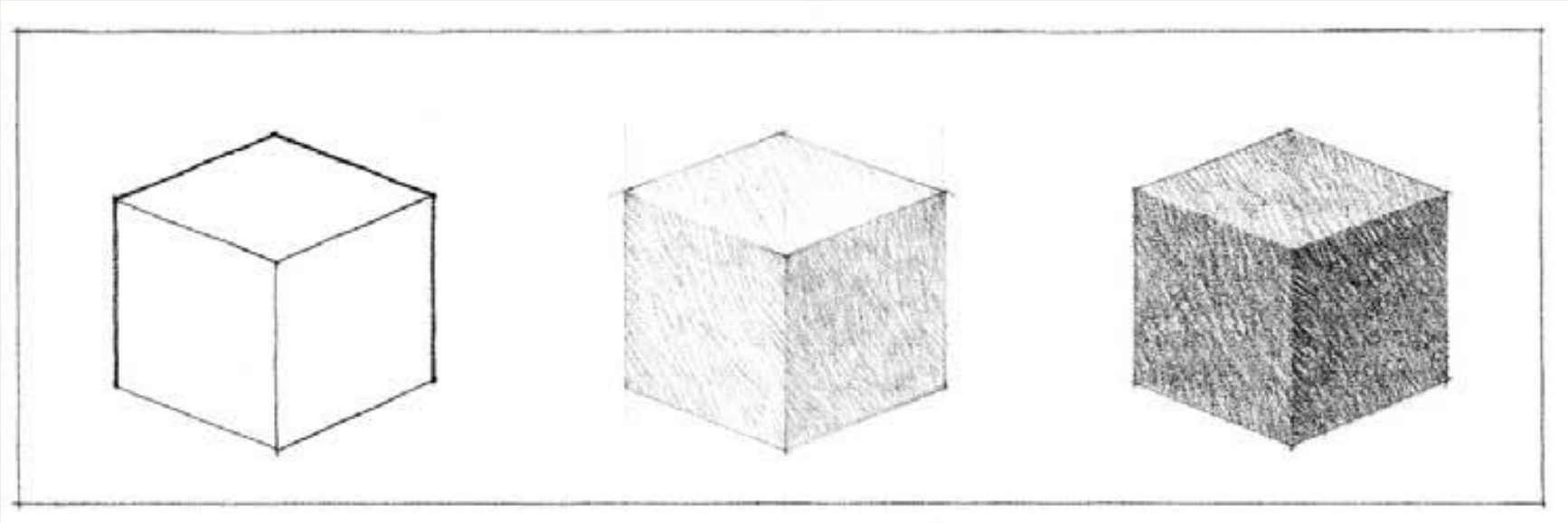
Size

- The physical dimensions of length, width, and depth of a form.
- While these dimensions determine the proportions of a form, its scale is determined by its size relative to other forms in its context.



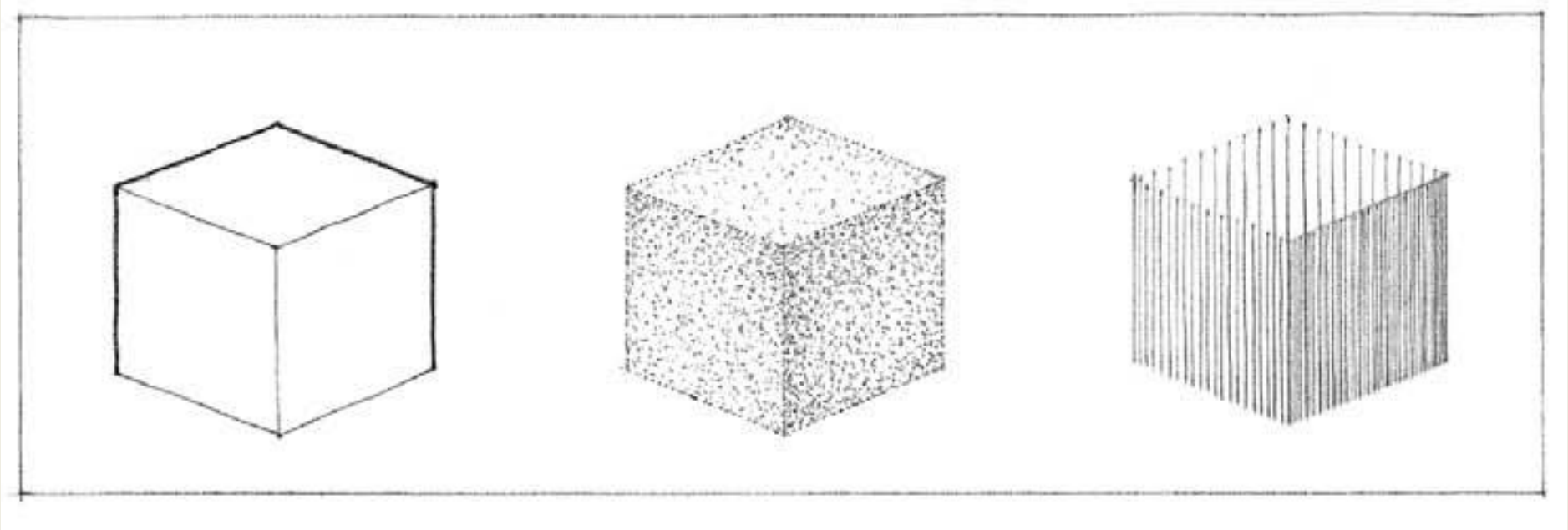
Color

- A phenomenon of light and visual perception that may be described in terms of an individual's perception of hue, saturation, and tonal value.
- Color is the attribute that most clearly distinguishes a form from its environment.
- It also affects the visual weight of a form.



Texture

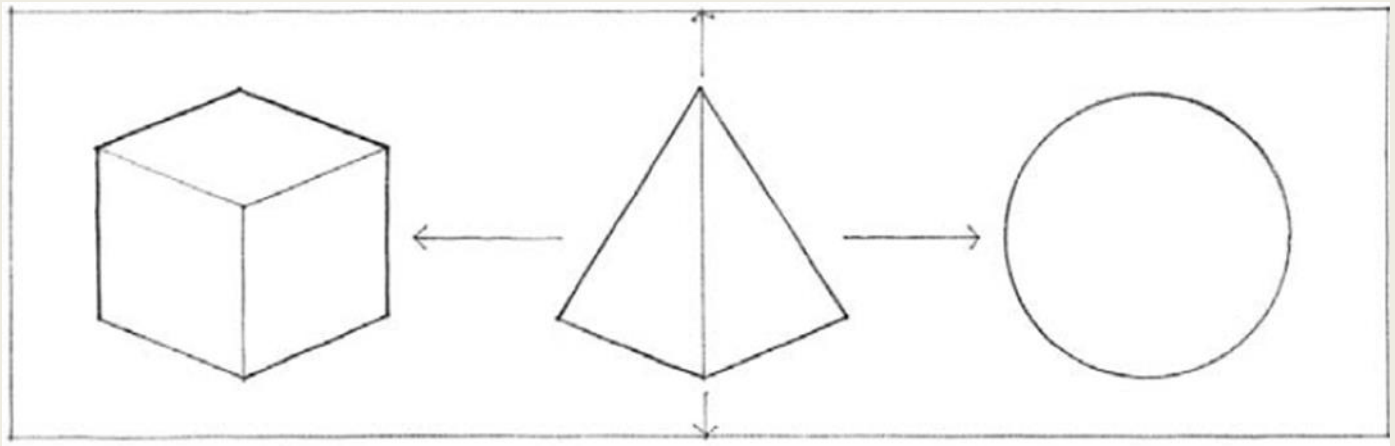
- The visual and especially tactile quality given to a surface by the size, shape, arrangement, and proportions of the parts.
- Texture also determines the degree to which the surfaces of a form reflect or absorb incident light.



Forms also have relational properties that govern the pattern and composition of elements

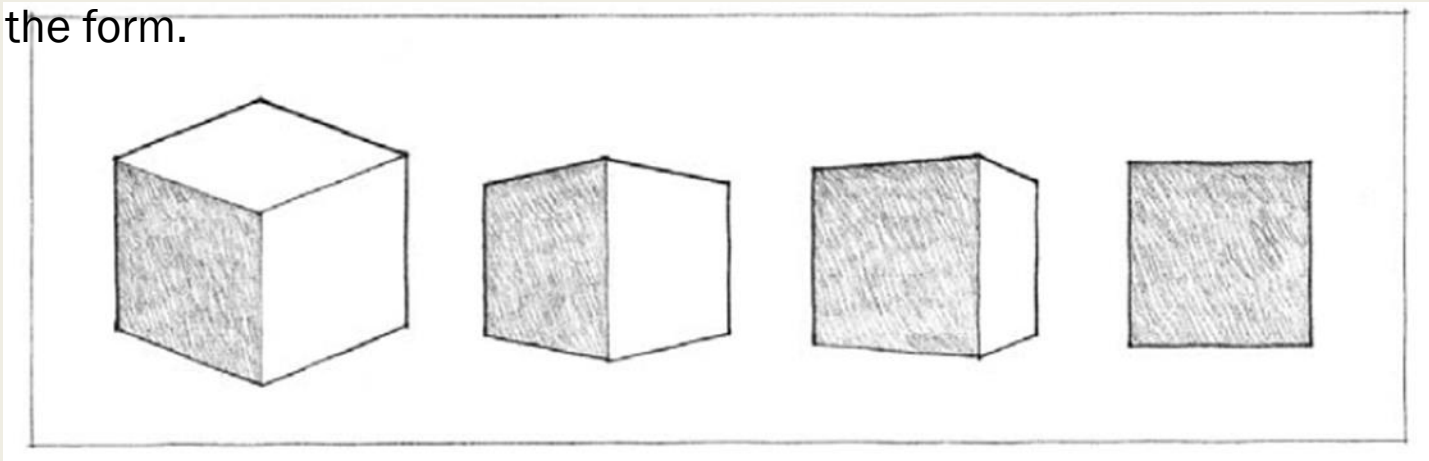
1. Position

The location of a form relative to its environment or the visual field within which it is seen



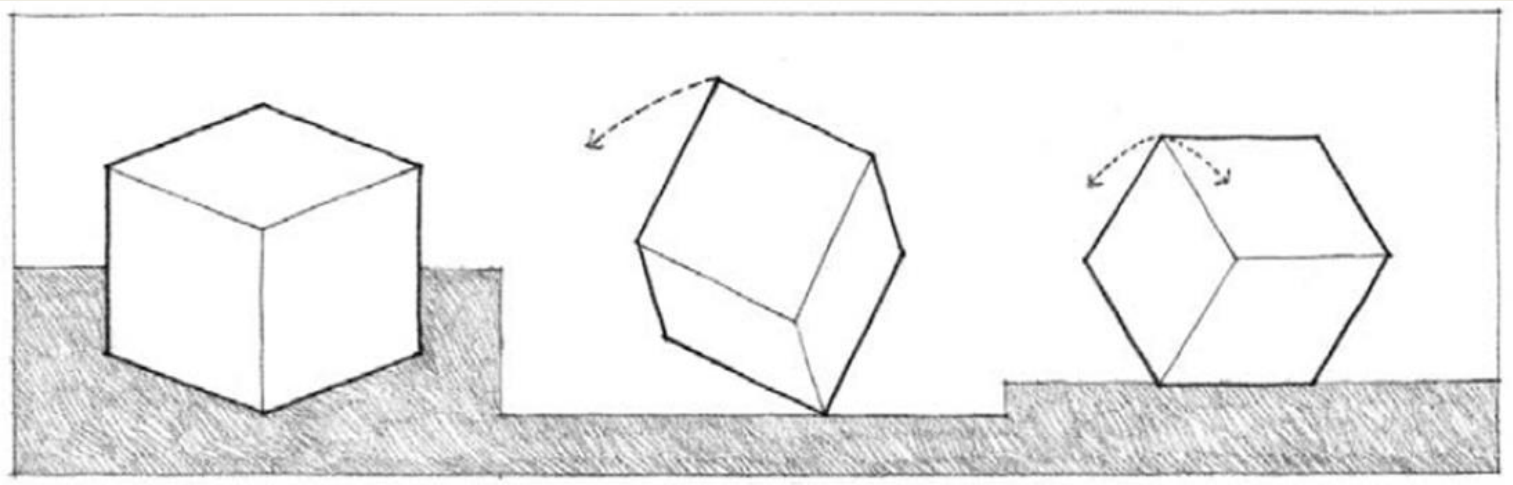
2. Orientation

The direction of a form relative to the ground plane, the compass points, other forms, or to the person viewing the form.



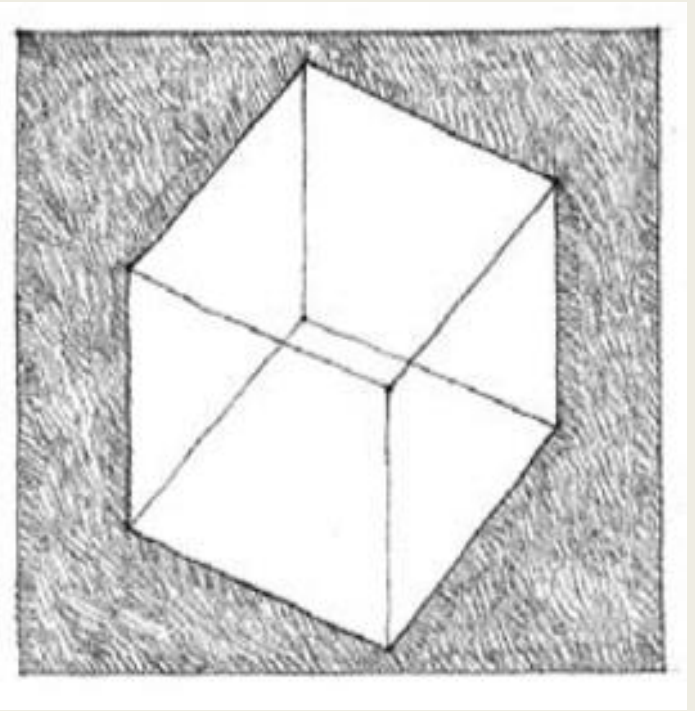
3. Visual Inertia

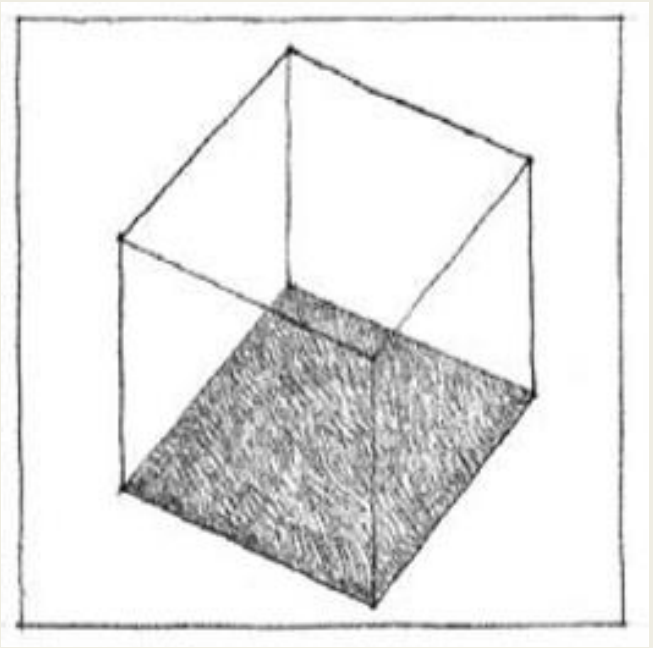
The degree of concentration and stability of a form.

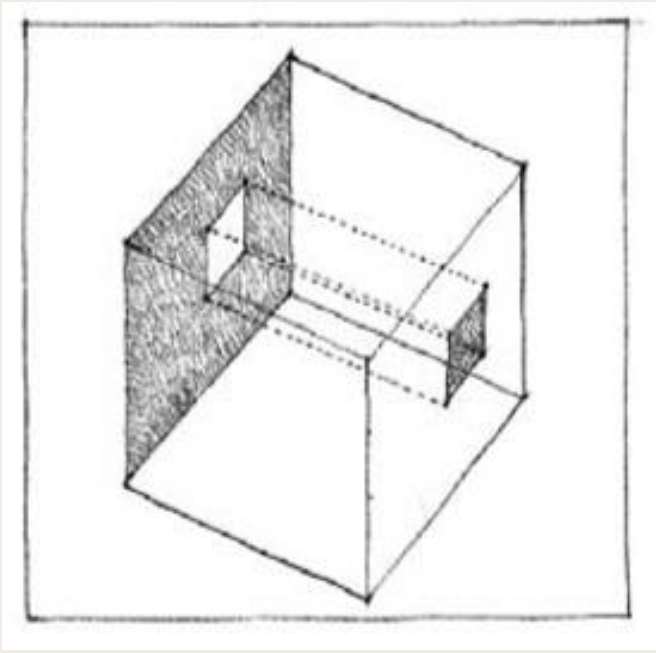


In architecture, we are concerned with the shapes of:

- floor, wall, and ceiling planes that enclose space
- door and window openings within a spatial enclosure
- silhouettes and contours of building forms

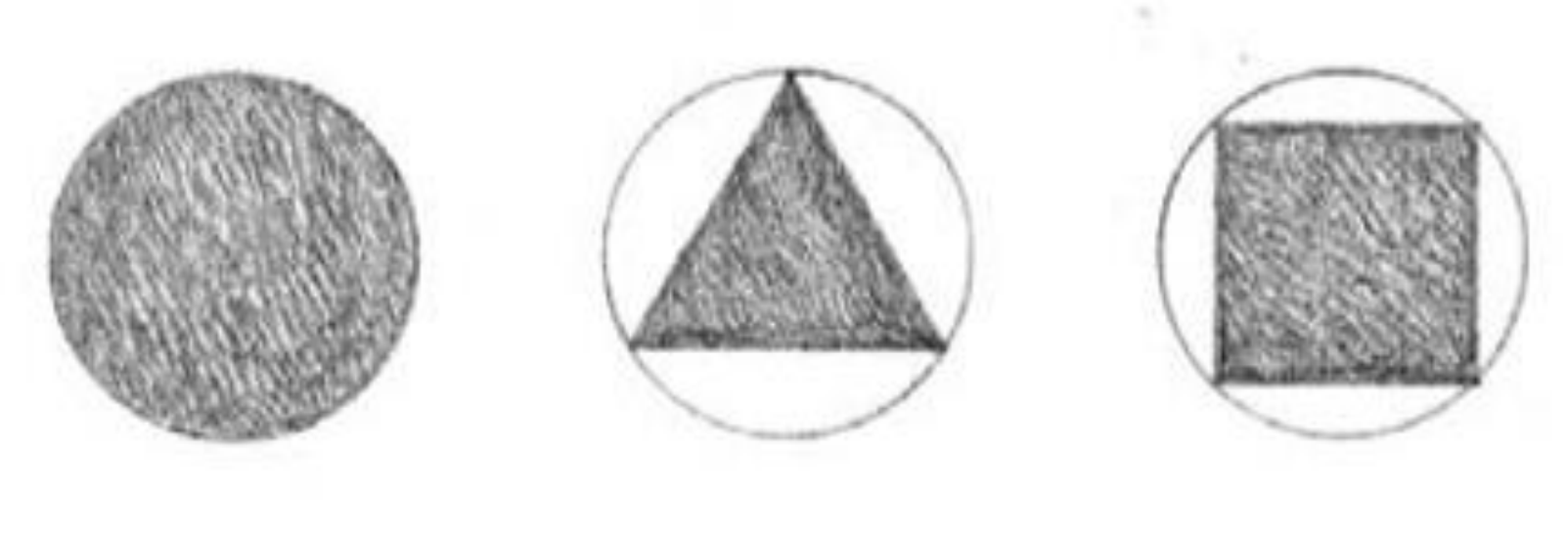






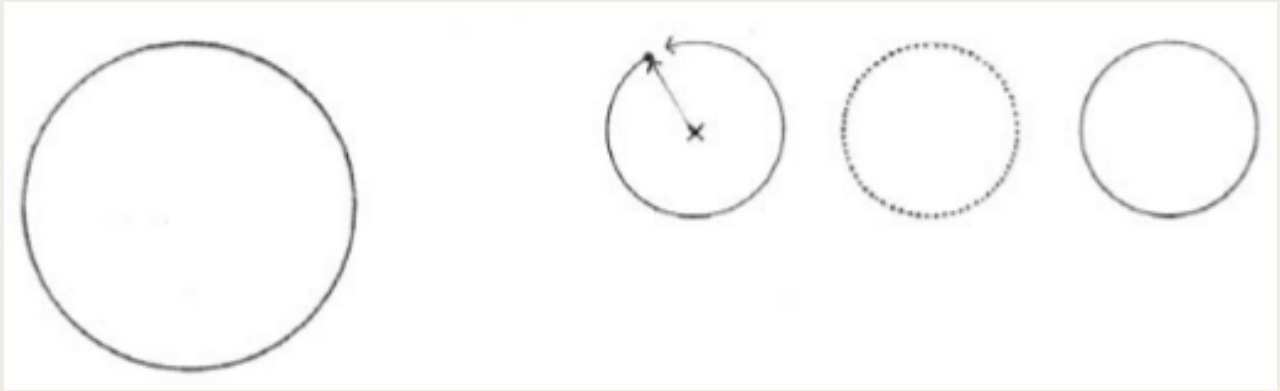
PRIMARY SHAPES

- the most significant shapes are the primary shapes: the circle, the triangle, and the square.



- Circle

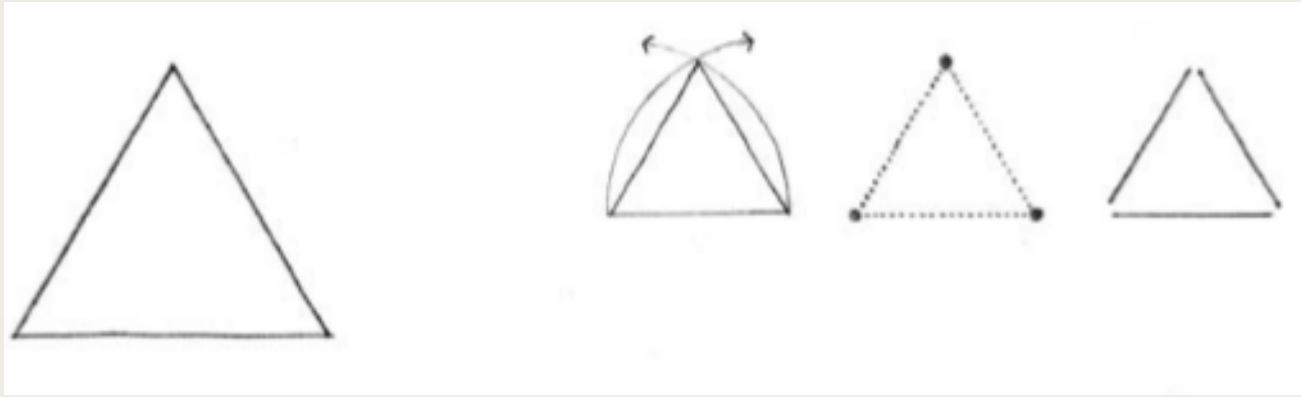
A plane curve every point of which is equidistant from a fixed point within the curve



- Triangle

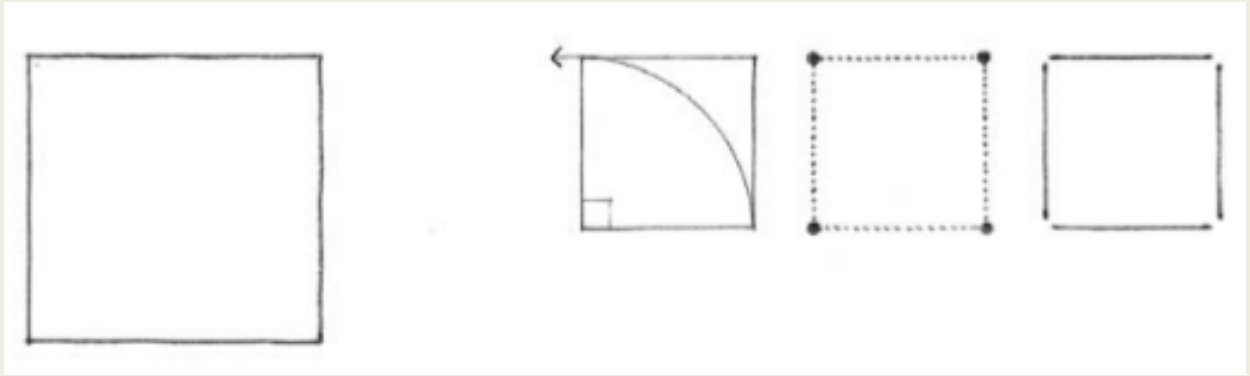
A plane figure bounded by three sides and

having three angles

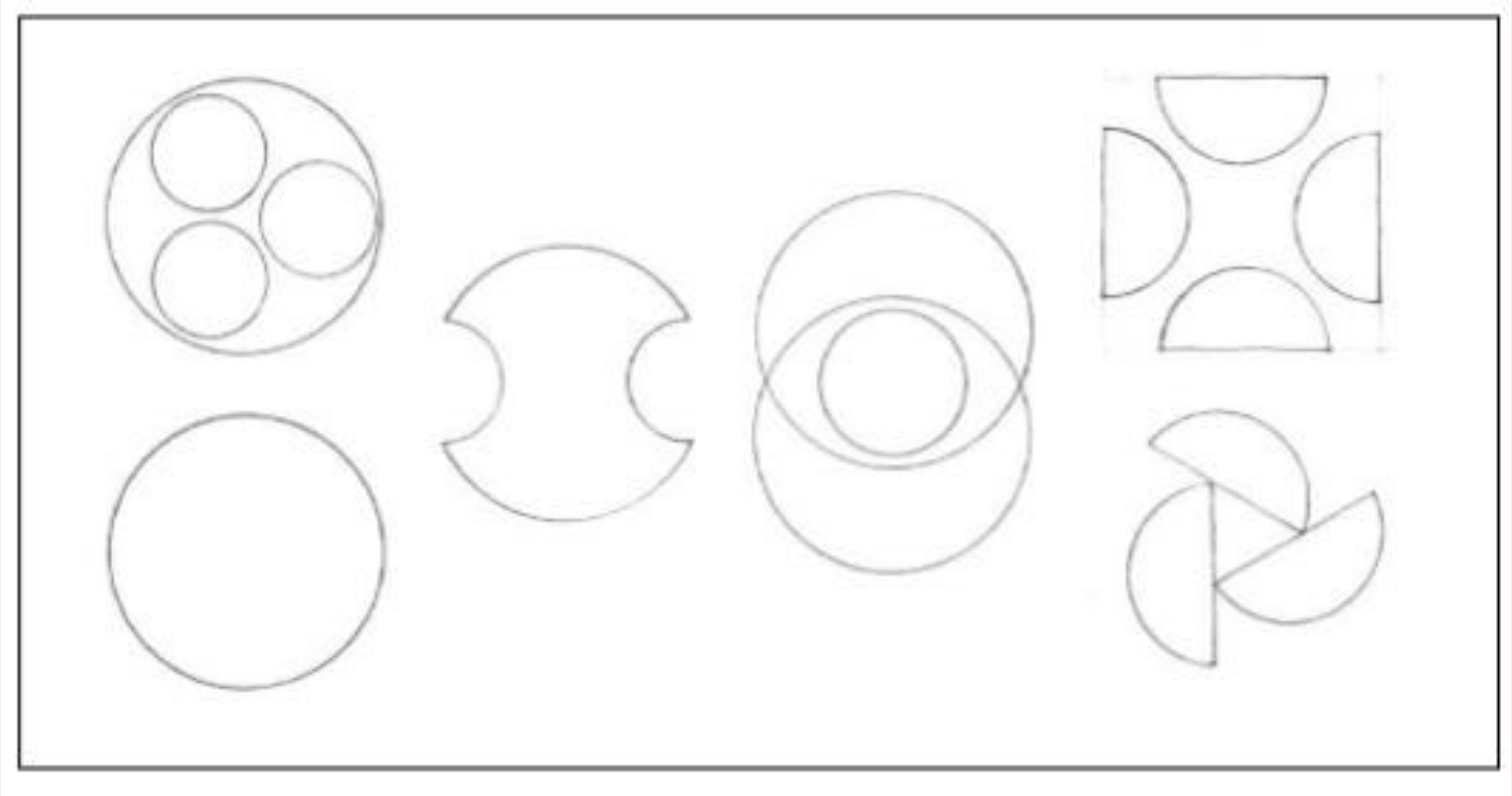


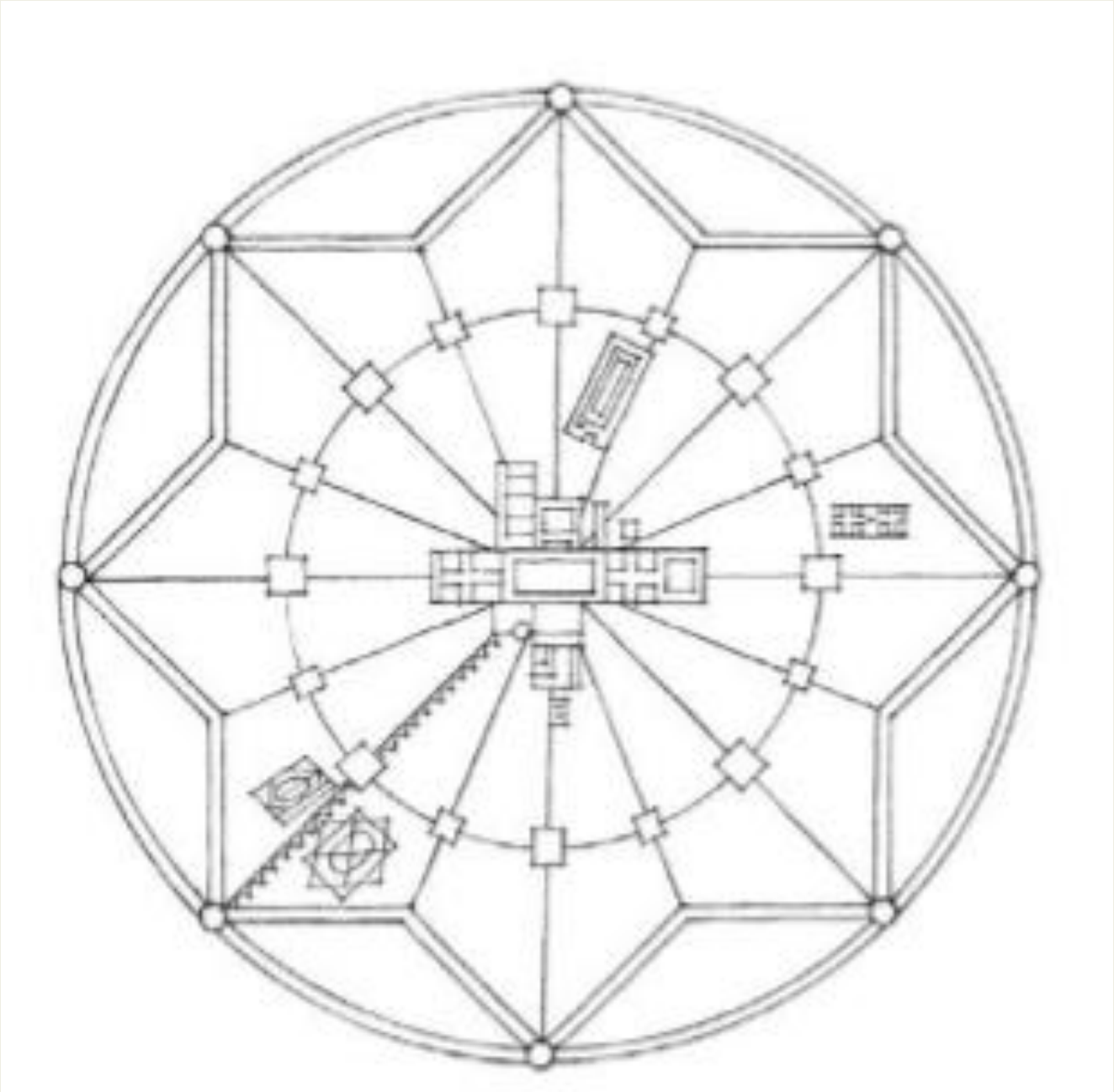
- Square

A plane figure having four equal sides and four right angles



Compositions of circles and circular segments

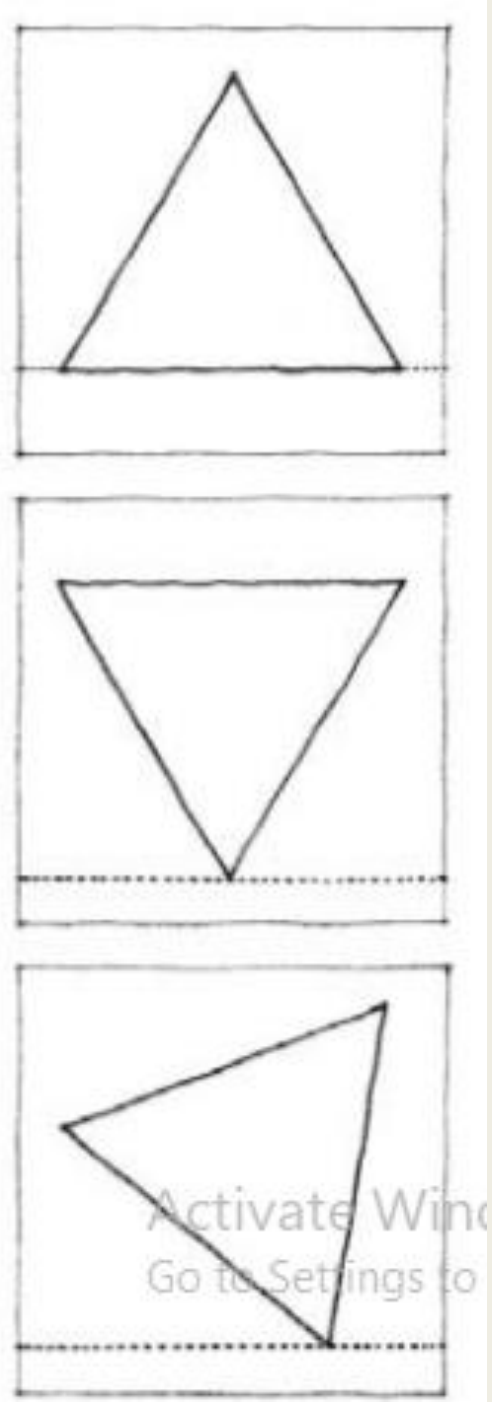




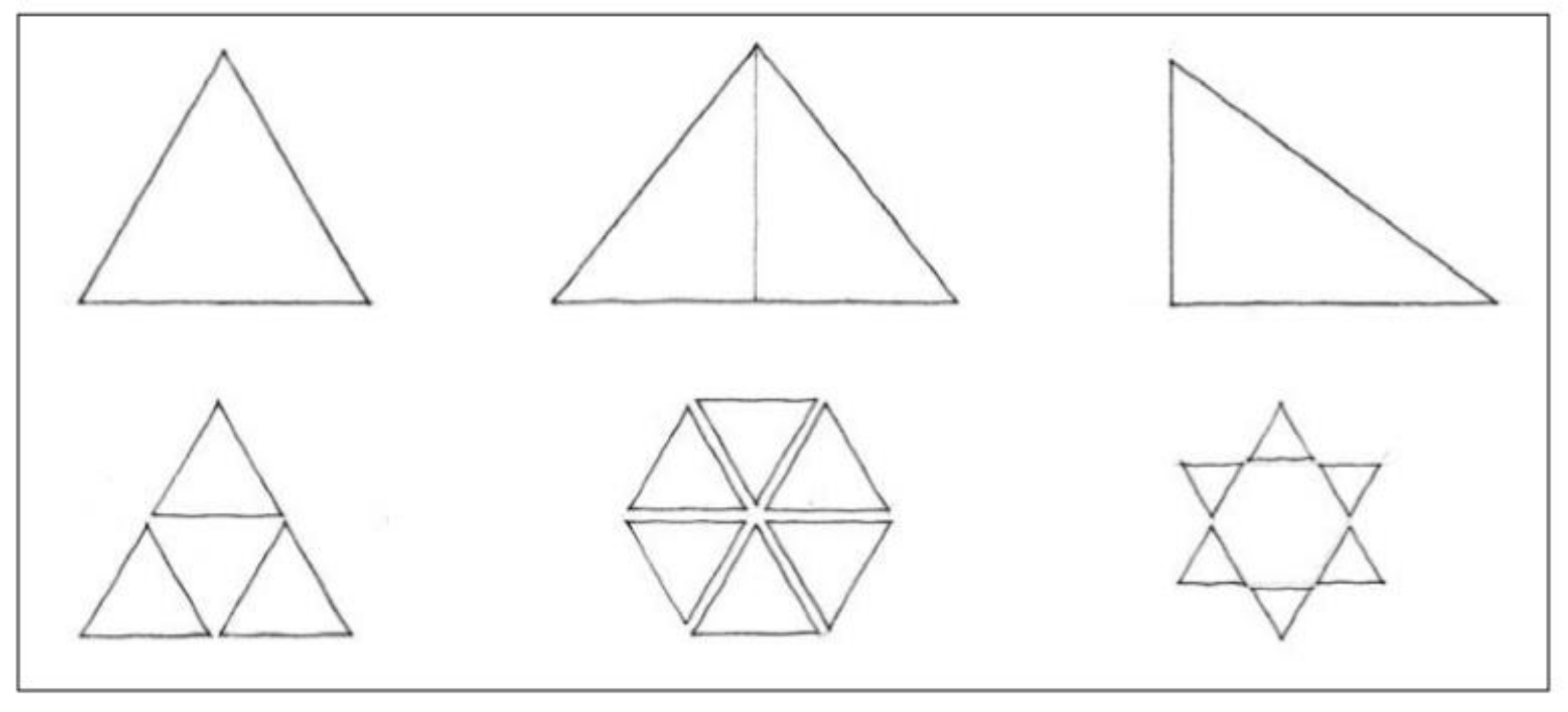
Plan of the Ideal City of Sforzinda, 1464, Antonio Filarete

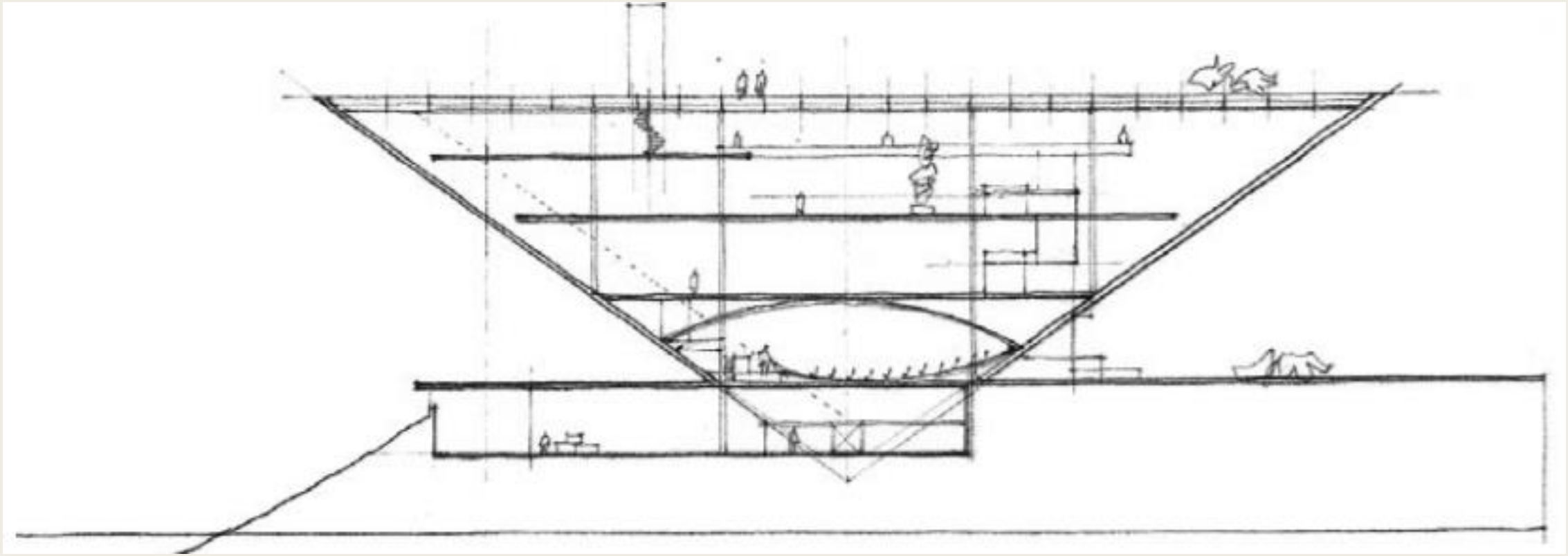
TRIANGLE

- The triangle signifies stability.
- When resting on one of its sides, the triangle is an extremely stable figure.
- When tipped to stand on one of its vertices, however, it can either be balanced in a precarious state of equilibrium or be unstable and tend to fall over onto one of its sides

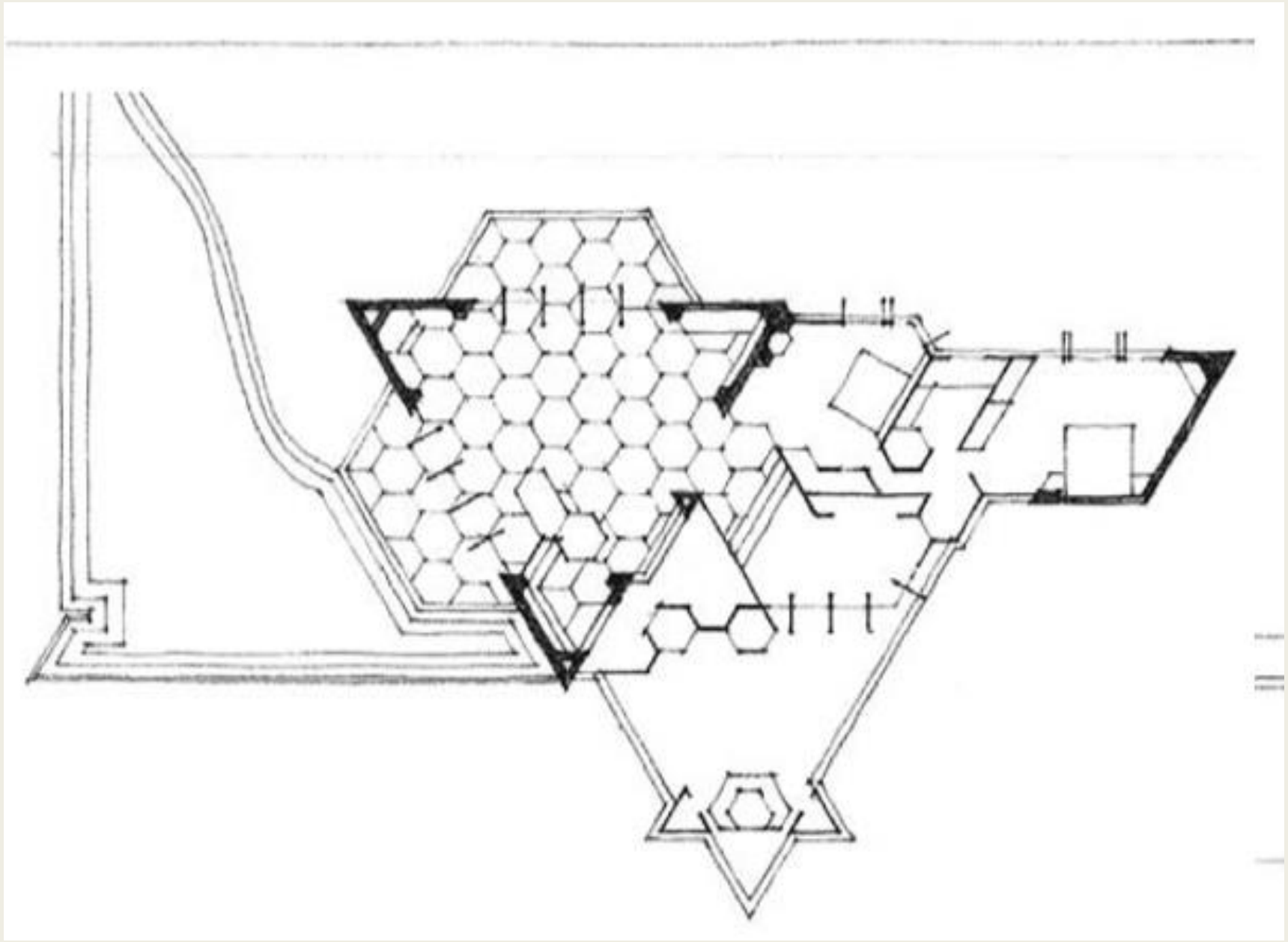


Compositions of triangle and triangular segments





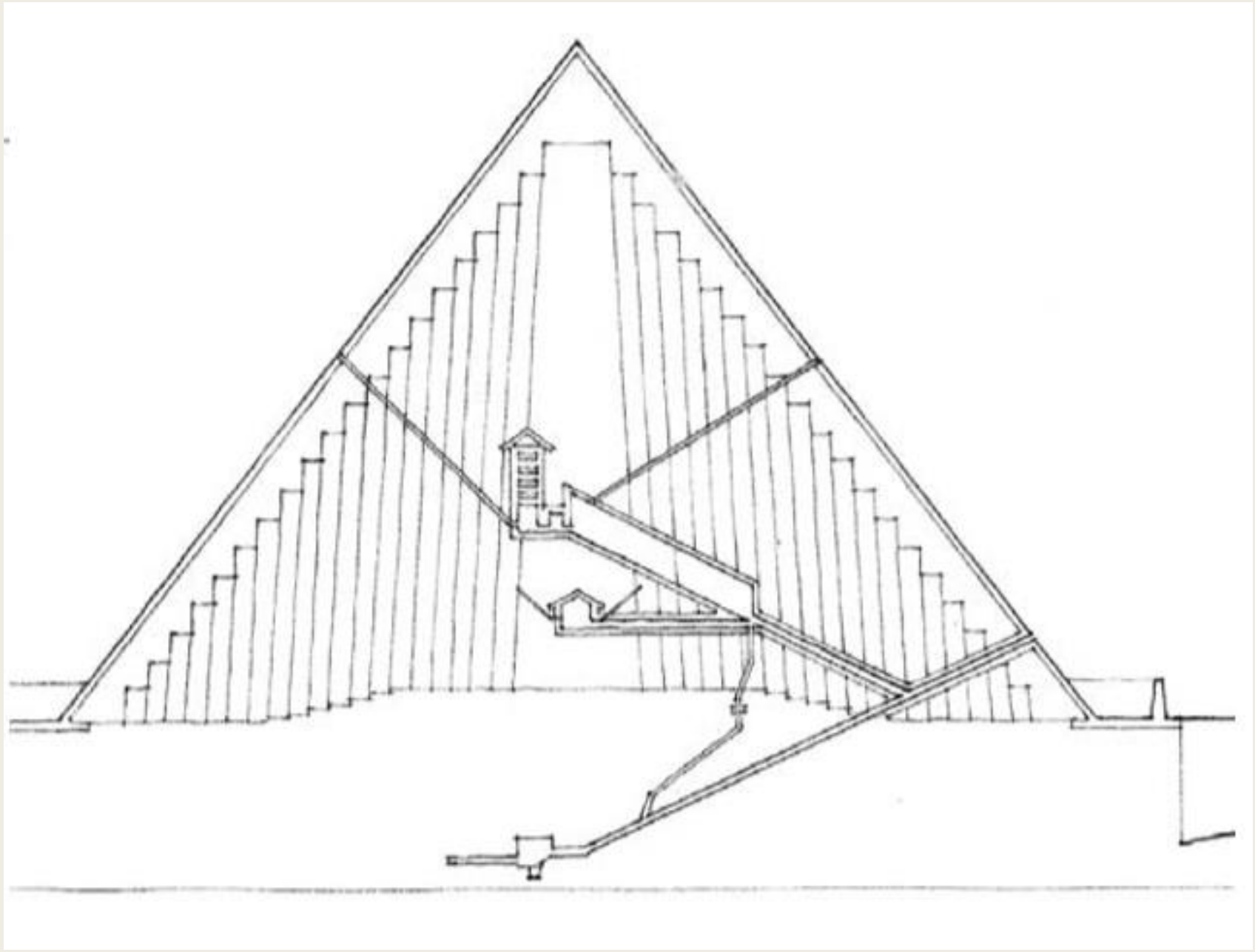
Modern Art Museum,
Caracas, Venezuela, 1955, Oscar Niemeyer



Vigo Dundt House
By Frank Lloyd Write

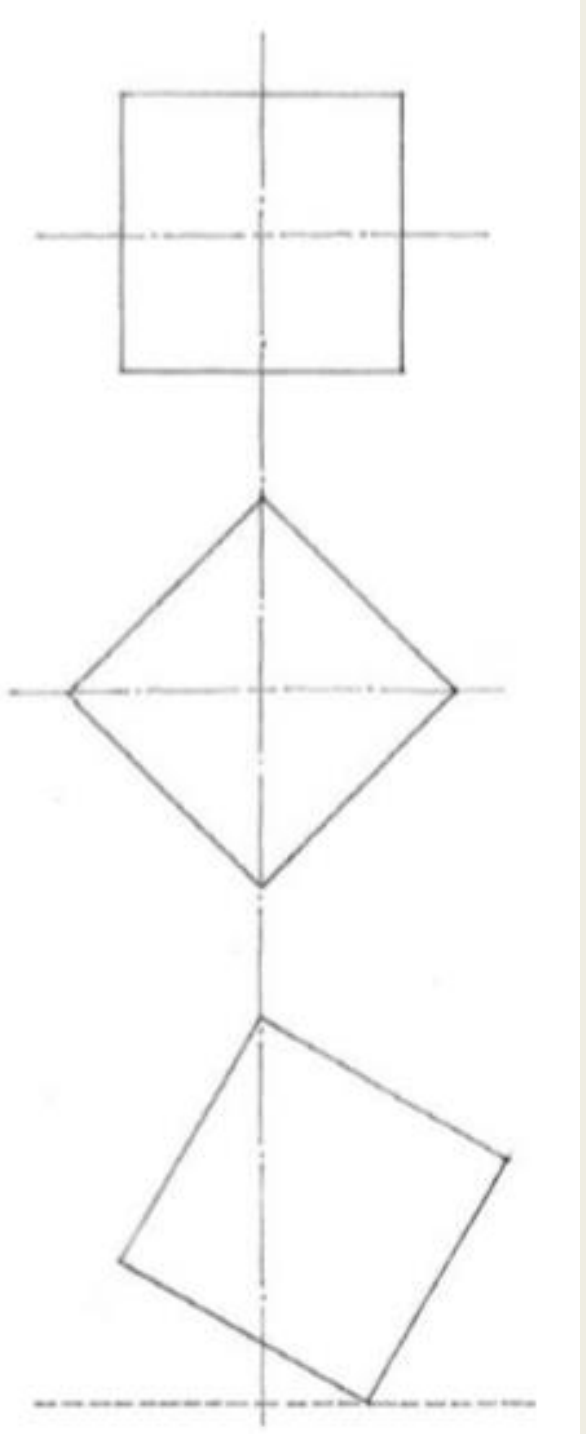
1942

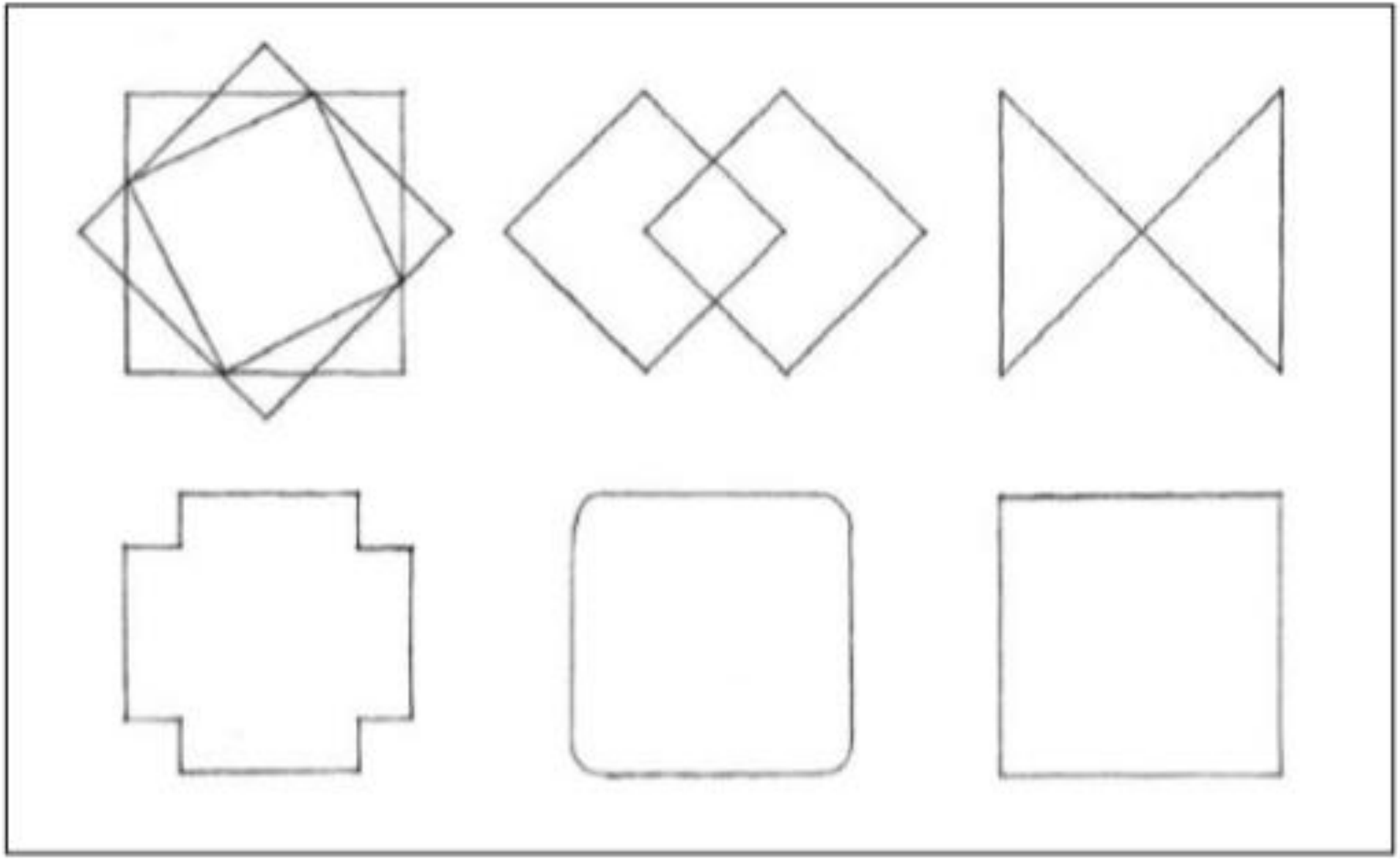
Great Pyramid of Cheops at Giza, Egypt, c. 2500 B.C.



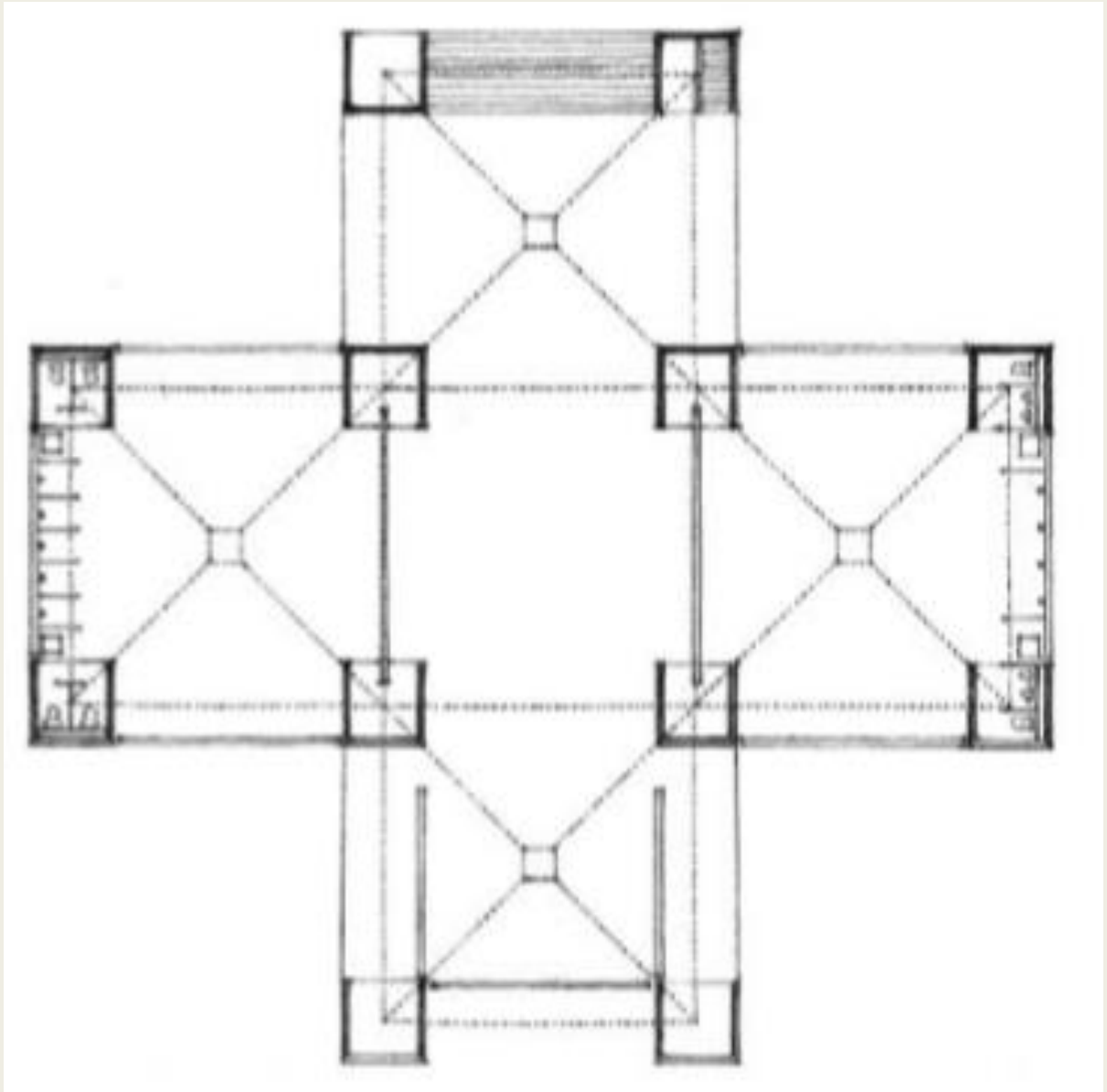
SQUARE

- The square represents the pure and the rational.
- It has two equal and perpendicular axes.
- Like the triangle, the square is stable when resting on one of its sides and dynamic when standing on one of its corners.



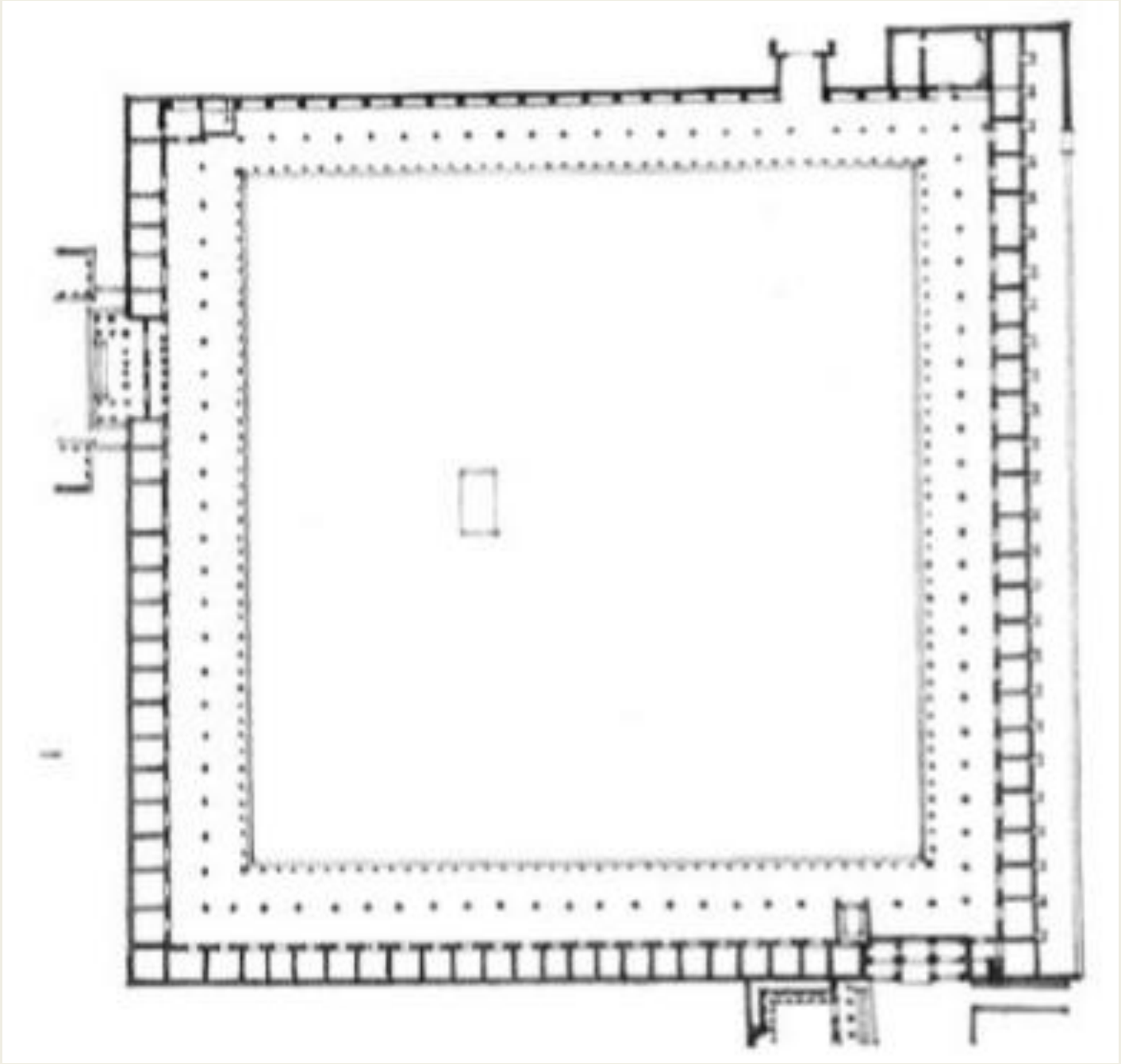


Compositions resulting from the rotation and modification of the square



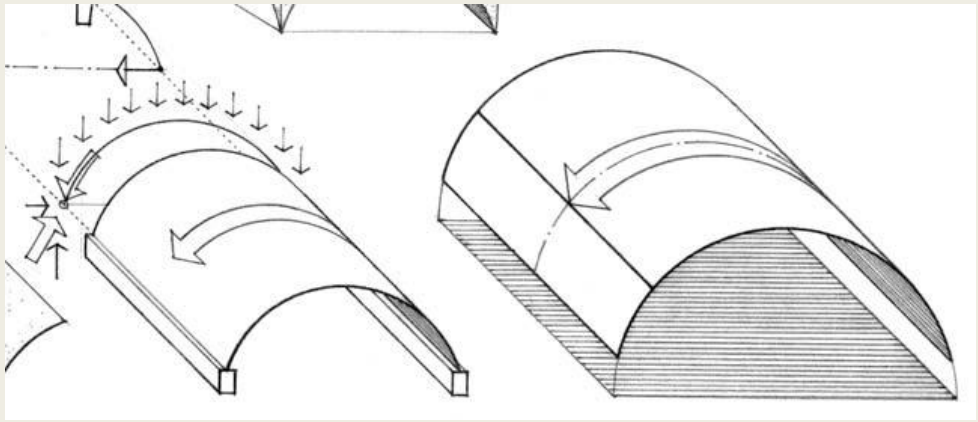
Bathhouse,
Jewish Community Center, Trenton, New Jersey, 1954–59, Louis Kahn

Agora of Ephesus
Asia Minor
3rd century B.C.

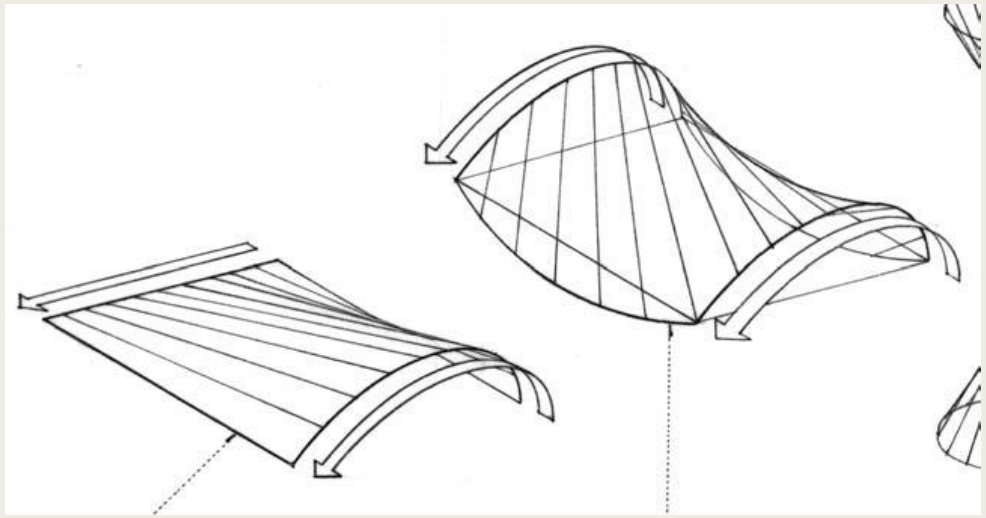


SURFACES

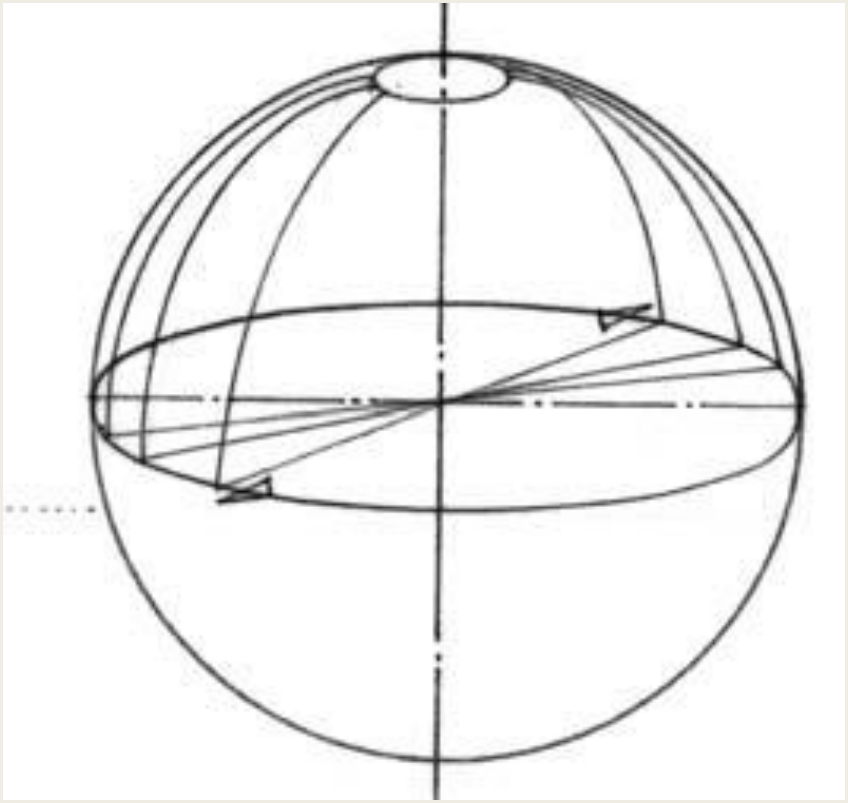
- Surface first refers to any figure having only two dimensions, such as a flat plane.
- These are a class of curved surfaces include the following:
- **Cylindrical surfaces** are generated by sliding a straight line along a plane curve, or vice versa. Depending on the curve, a cylindrical surface may be circular, elliptic, or parabolic.



- **Translational surfaces** are generated by sliding a plane curve along a straight line or over another plane curve.

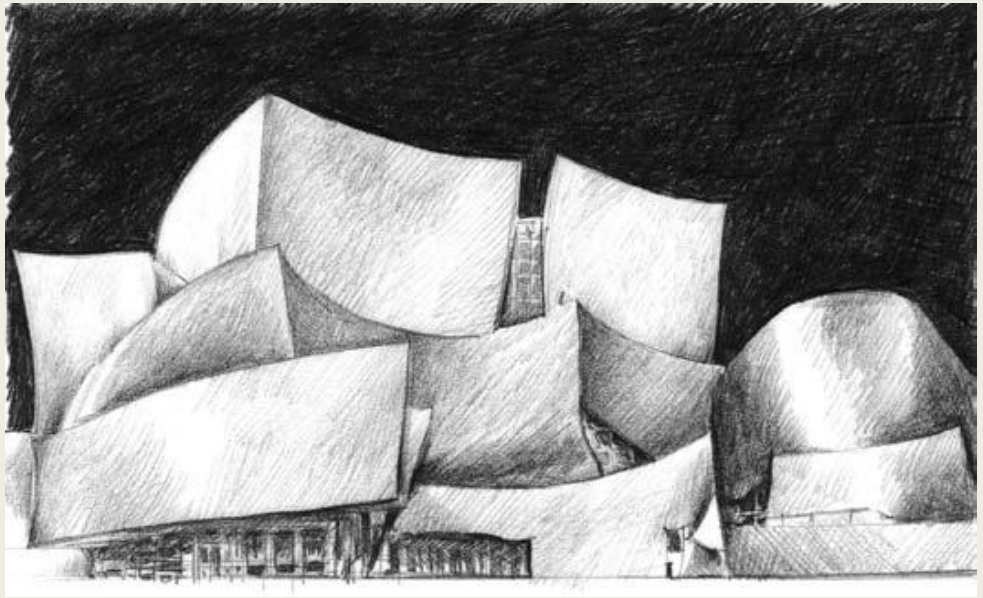


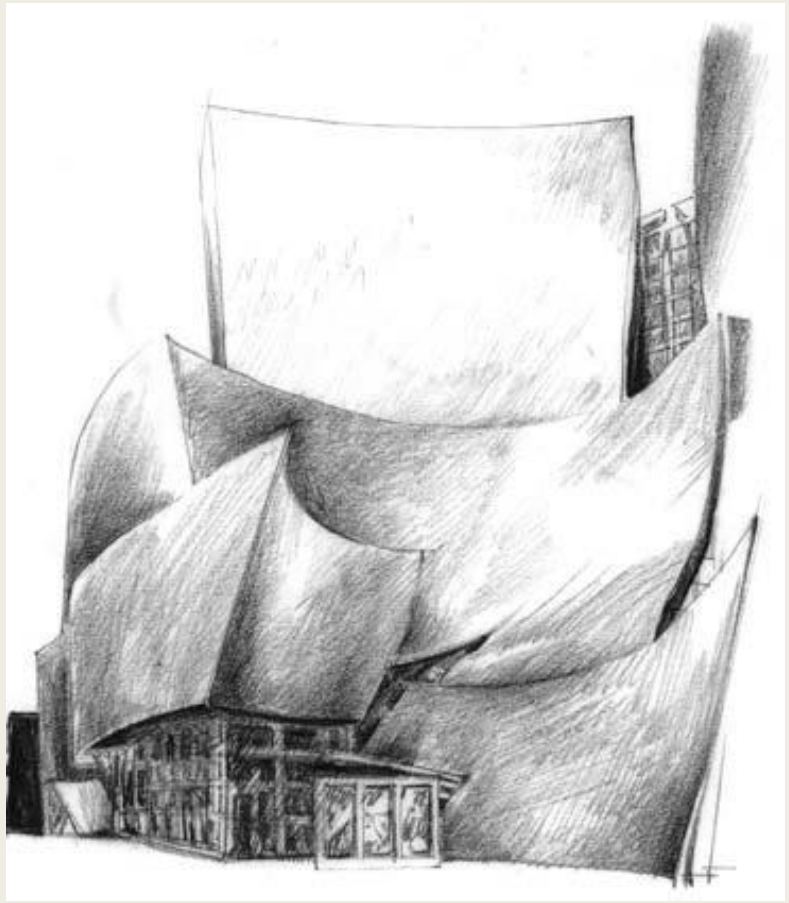
- **Ruled surfaces** are generated by the motion of a straight line. Because of its straight line geometry, a ruled surface is generally easier to form and construct than a rotational or translational surface.

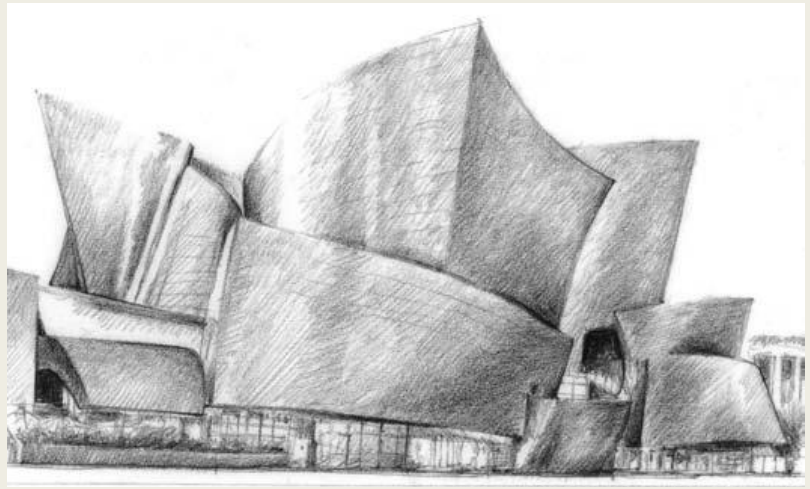


- **Rotational surfaces** are generated by rotating a plane curve about an axis

Their shapes change dramatically as we view them from different perspectives.







Walt Disney Concert Hall, Los Angeles, California, 1987–2003, Frank O. Gehry & Partners

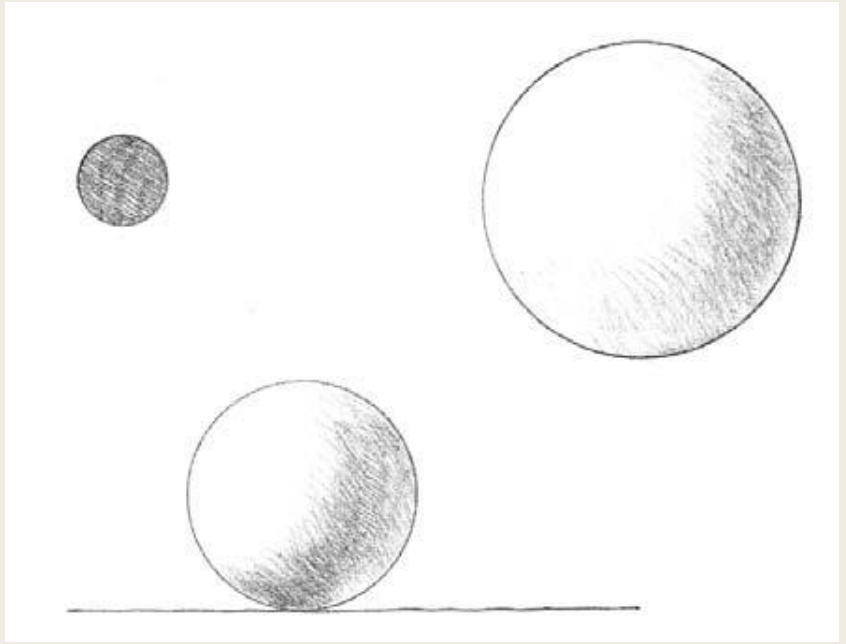
PRIMARY SOLIDS

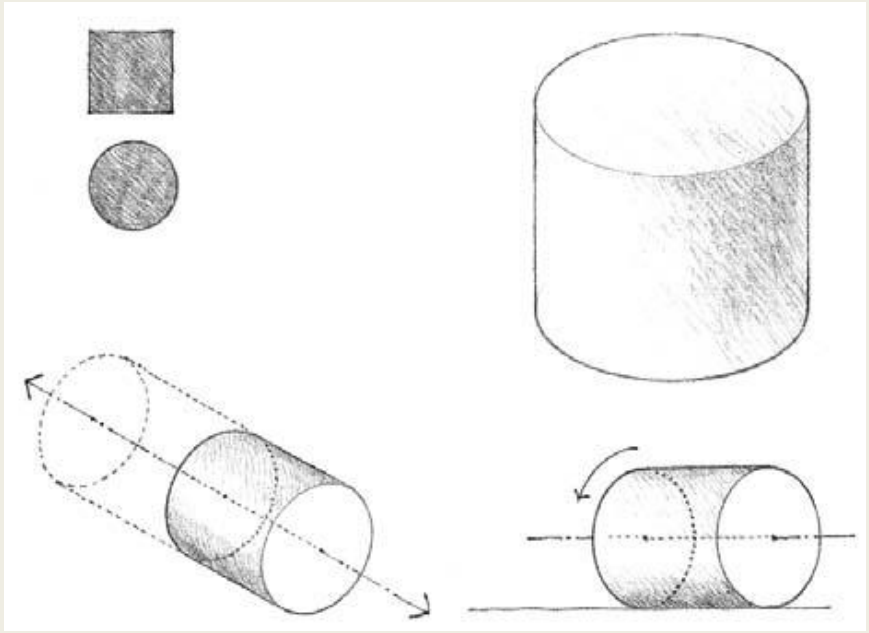
The primary shapes can be extended or rotated to generate volumetric forms or solids that are distinct, regular, and easily recognizable.

- Circles generate spheres and cylinders;
- triangles generate cones and pyramids;
- squares generate cubes.

Sphere

A solid generated by the revolution of a semicircle about its diameter, whose surface is at all points equidistant from the center.

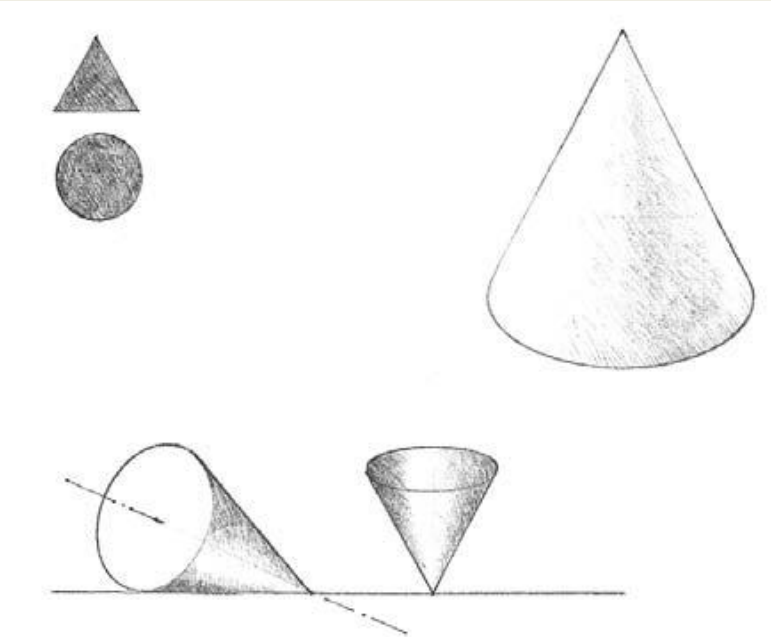




Cylinder

A solid generated by the revolution of a rectangle about one of its sides.

A cylinder is centralized about the axis passing through the centers of its two circular faces. Along this axis, it can be easily extended.

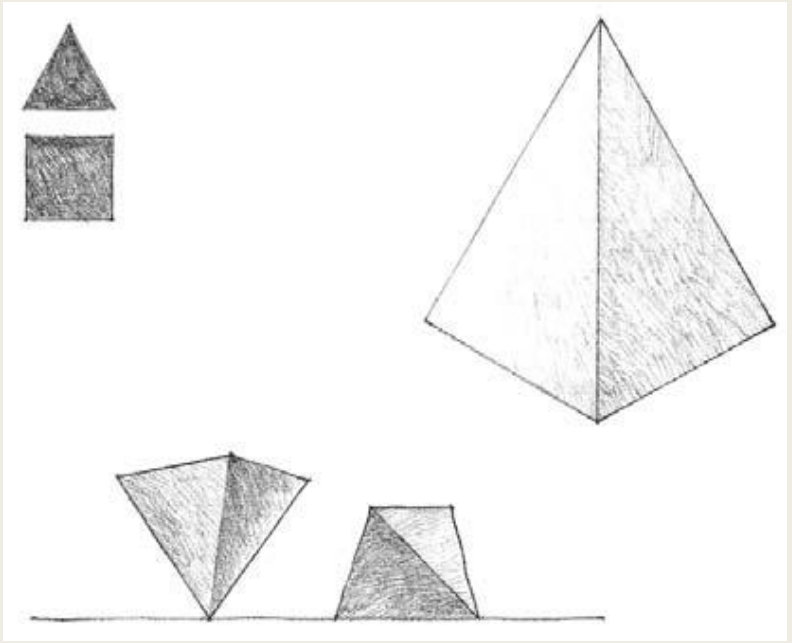


Cone

A solid generated by the revolution of a right triangle about one of its sides.
Like the cylinder, the cone is a highly stable form when resting on its circular base, and unstable when its vertical axis is tipped or overturned.
It can also rest on its apex in a precarious state of balance.

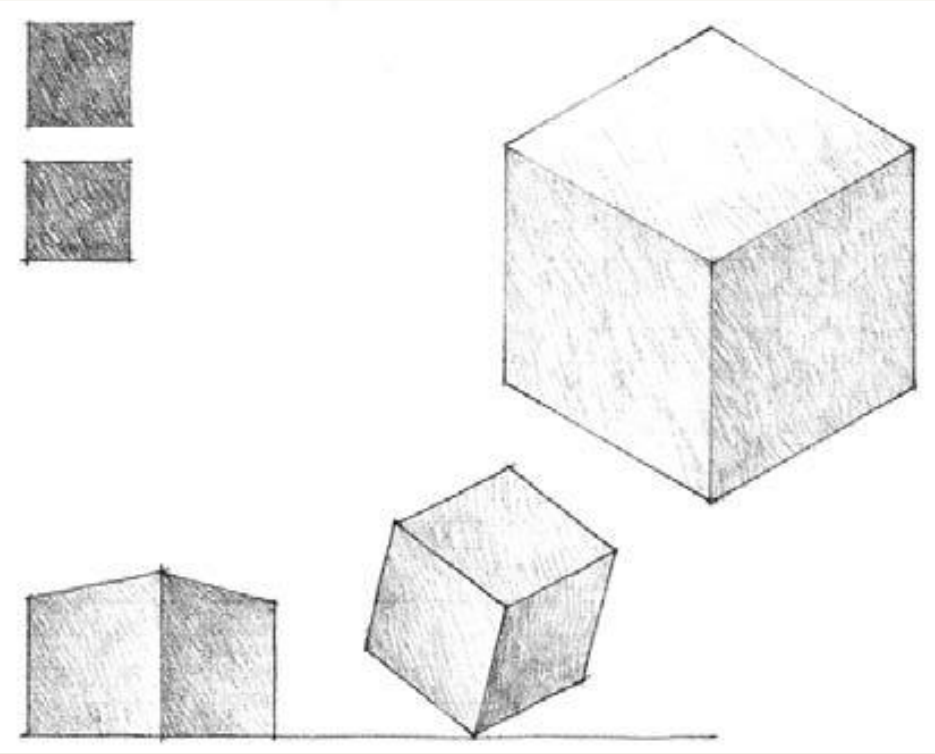
Pyramid

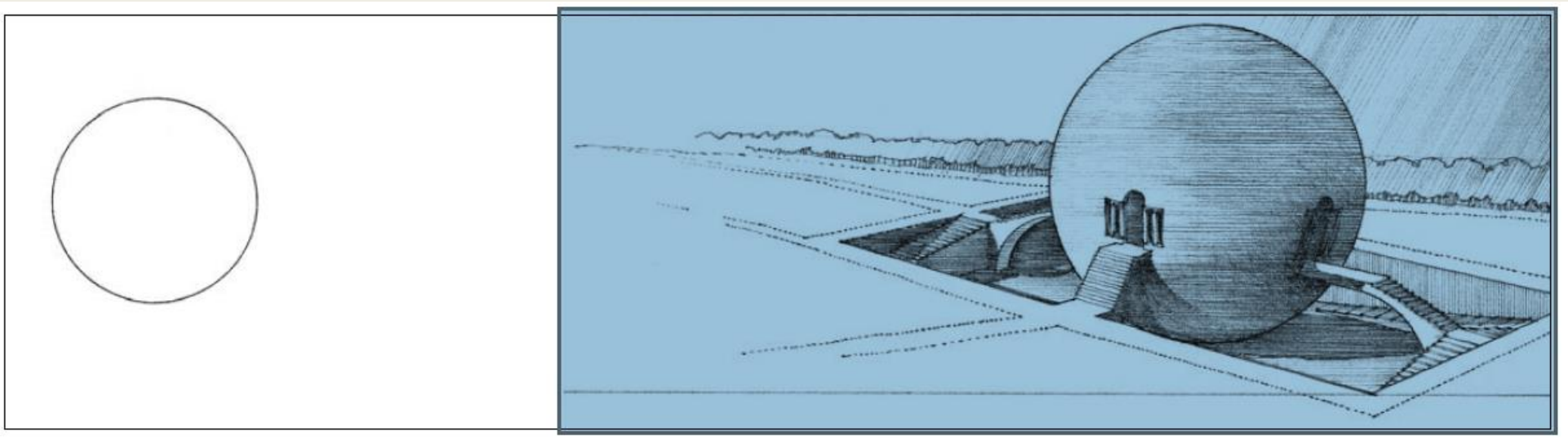
A polyhedron having a polygonal base and triangular faces meeting at a common point or vertex.
The pyramid has properties similar to those of the cone. Because all of its surfaces are flat planes, however, the pyramid can rest in a stable manner on any of its faces. While the cone is a soft form, the pyramid is relatively hard and angular.



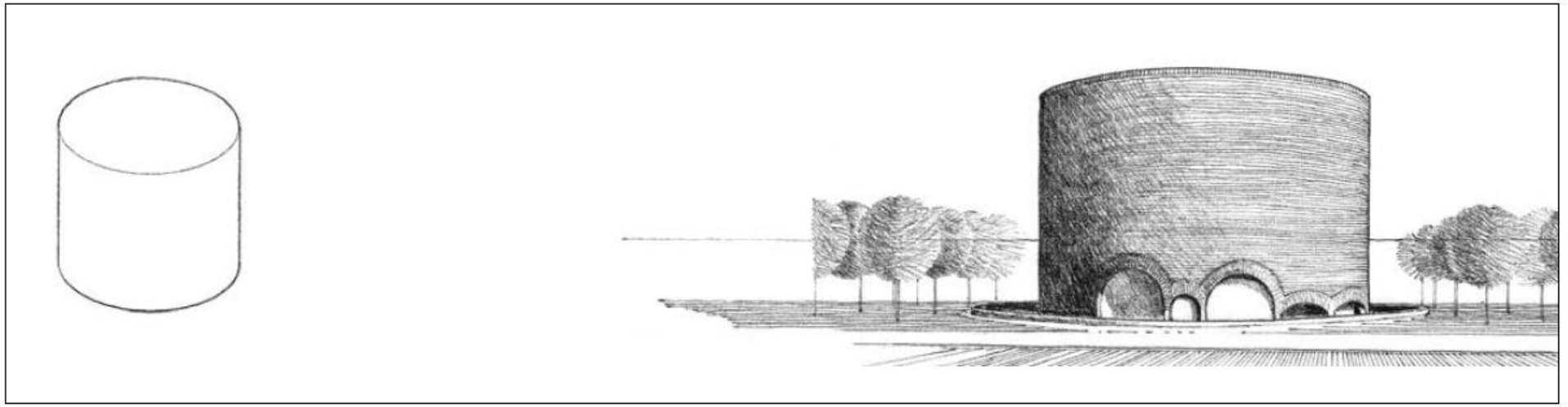
Cube

- A prismatic solid bounded by six equal square sides, the angle between any two adjacent faces being a right angle.
- Because of the equality of its dimensions, the cube is a static form that lacks apparent movement or direction.
- It is a stable form except when it stands on one of its edges or corners.
- Even though its angular profile is affected by our point of view, the cube remains a highly recognizable form.

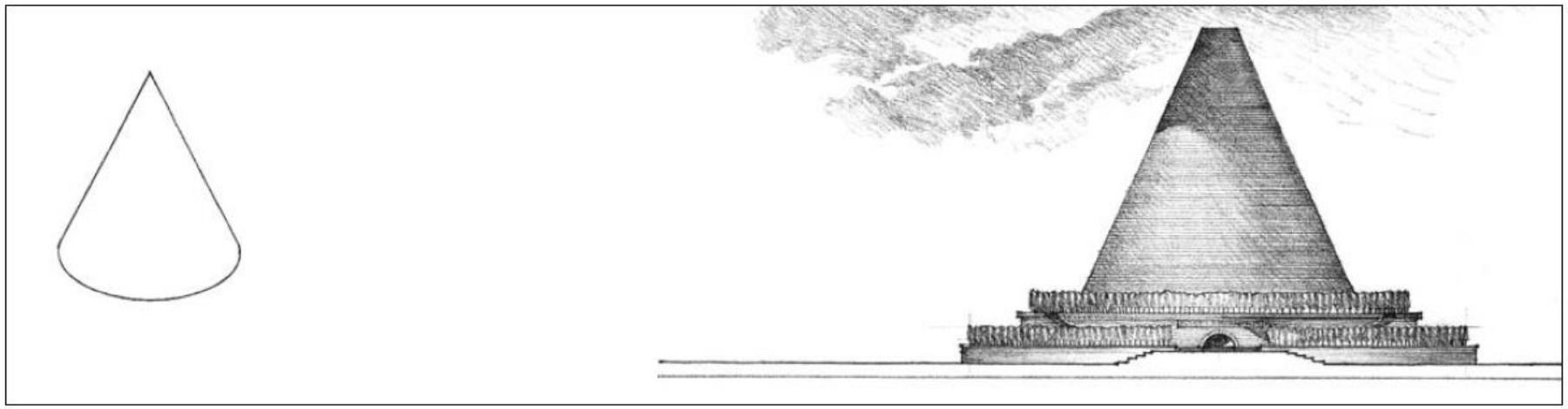




Maupertius, Project for an Agricultural Lodge, 1775, Claude-Nicolas Ledoux

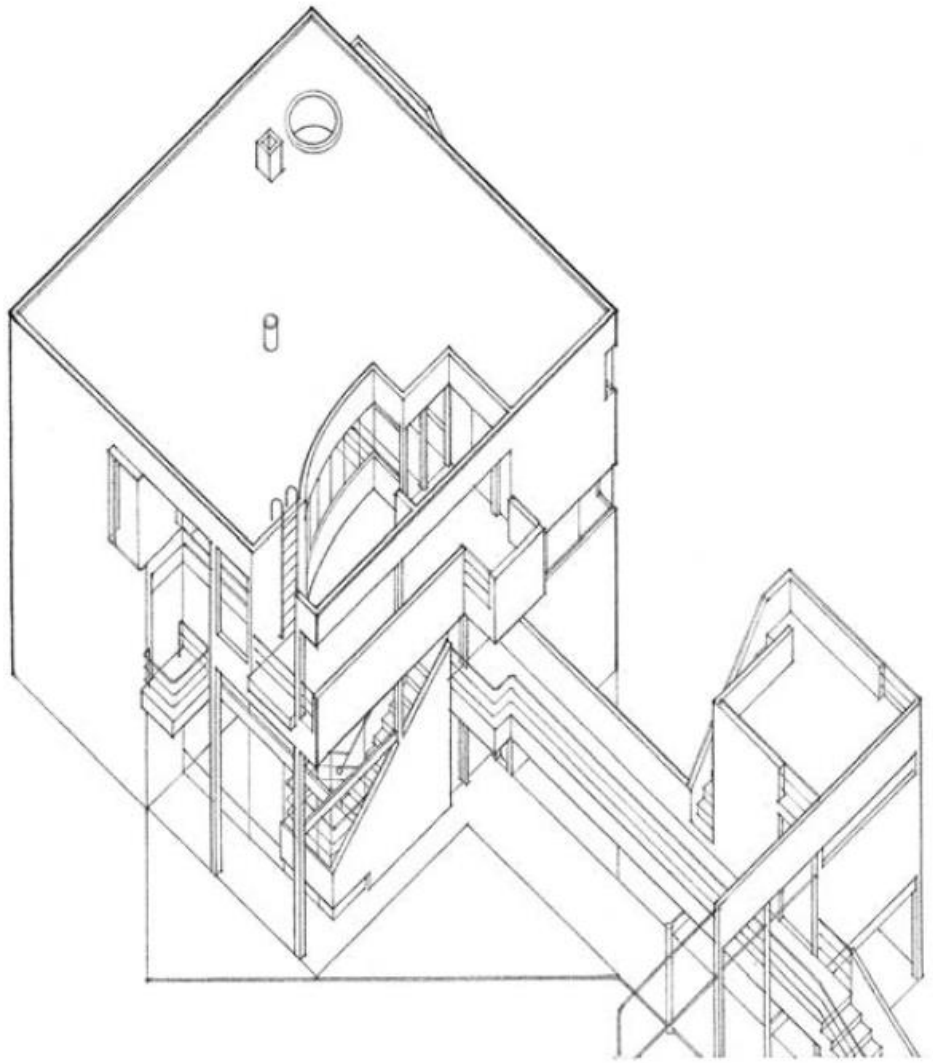


Chapel, Massachusetts Institute of Technology, Cambridge, Massachusetts, 1955, Eero Saarinen and Associates



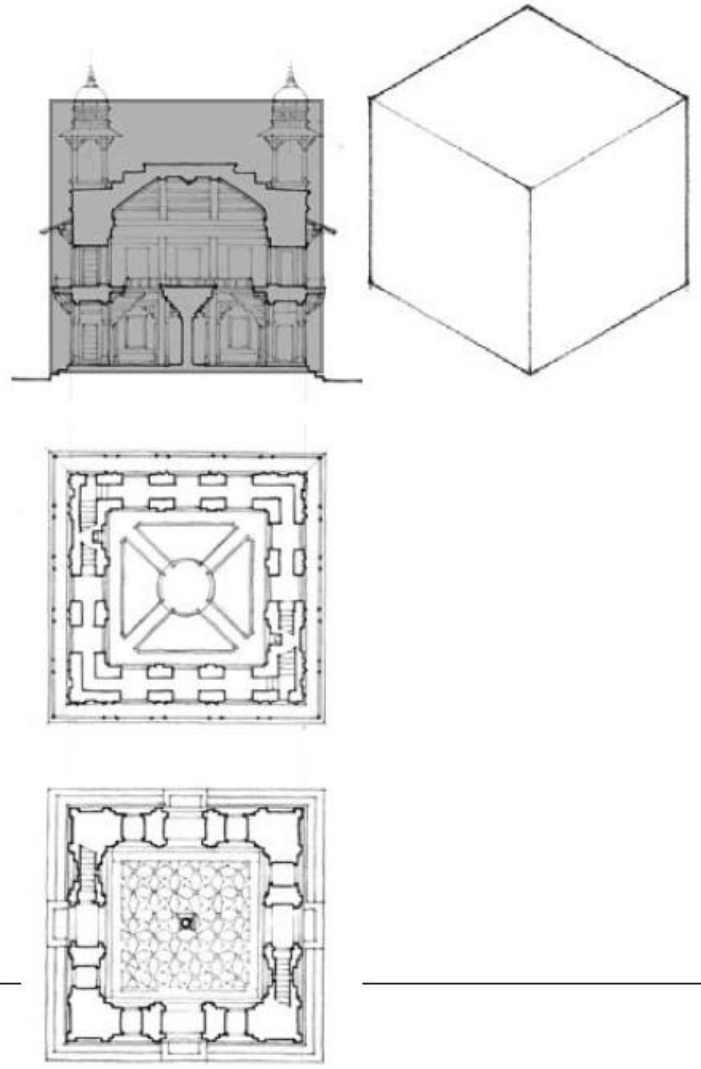
Project for a Conical Cenotaph, 1784, Étienne-Louis Boulée

Pyramids of Cheops, Chephren, and Mykerinos at Giza, Egypt, c. 2500 B.C.



Hanselmann House, Fort Wayne, Indiana, 1967, Michael Graves

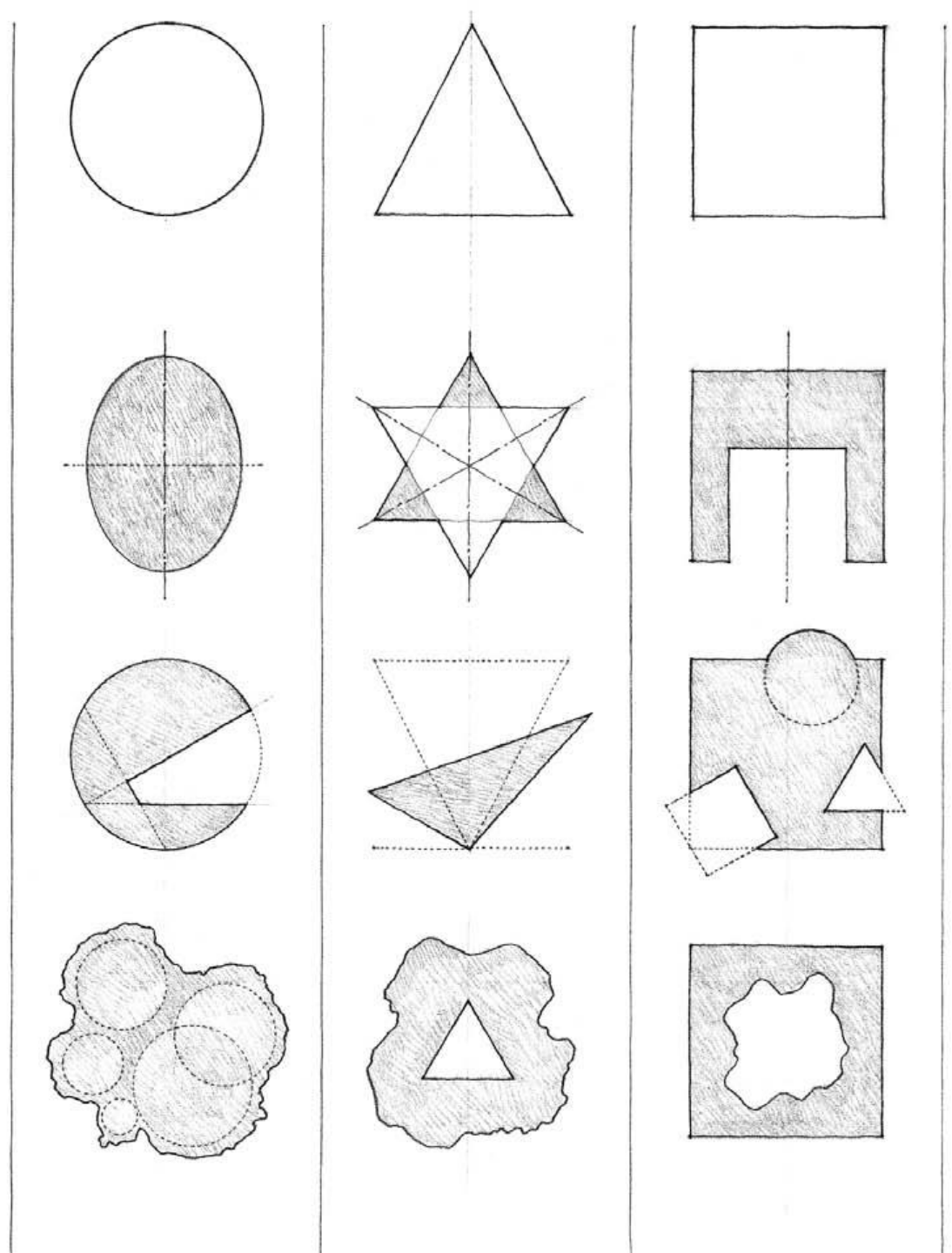
Diwan-i-Khas, Fatehpur Sikri,
Palace Complex of Akbar the Great
Mogul Emperor of India, 1569–74

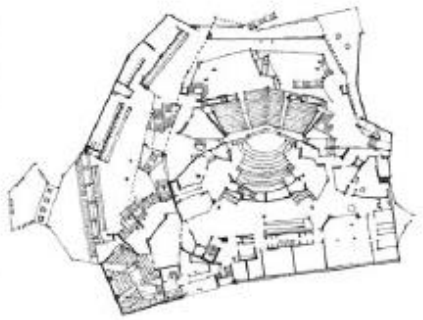


REGULAR & IRREGULAR FORMS

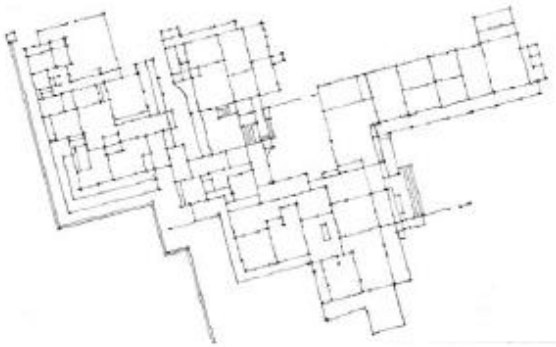
- Regular forms refer to those whose parts are related to one another in a consistent and orderly manner.
- They are generally stable in nature and symmetrical about one or more axes
- The sphere, cylinder, cone, cube, and pyramid are prime examples of regular forms.

- Irregular forms are those whose parts are dissimilar in nature and related to one another in an inconsistent manner.
- They are generally asymmetrical and more dynamic than regular forms.
- They can be regular forms from which irregular elements have been subtracted or result from an irregular composition of regular forms.

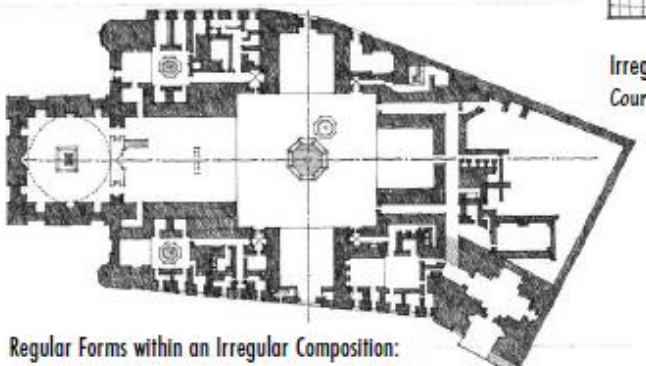




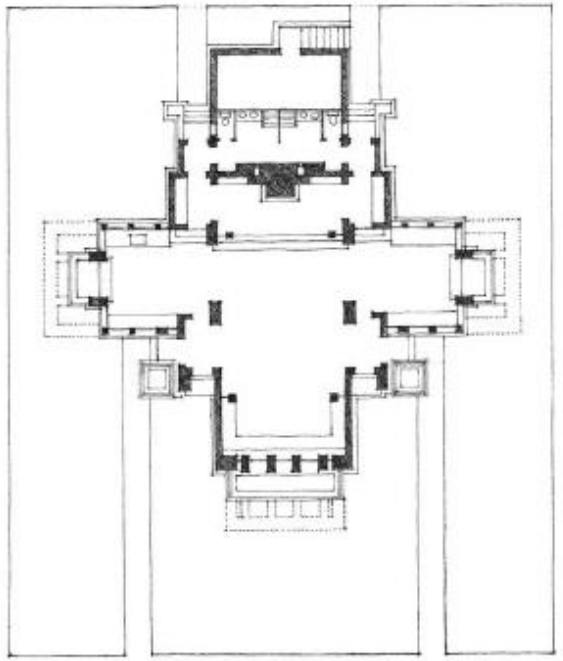
Irregular Forms:
Philharmonic Hall, Berlin, 1956–63, Hans Scharoun



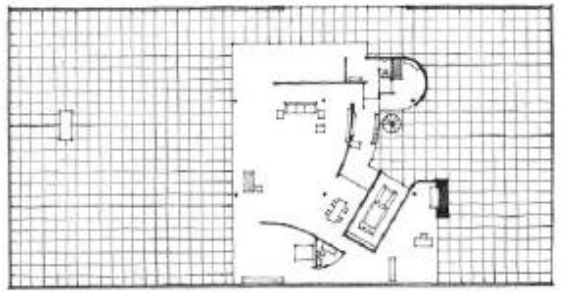
An Irregular Composition of Regular Forms:
Katsura Imperial Villa, Kyoto, Japan, 17th century



Regular Forms within an Irregular Composition:



A Regular Composition of Regular Forms:
Coonley Playhouse, Riverside, Illinois, 1912, Frank Lloyd Wright

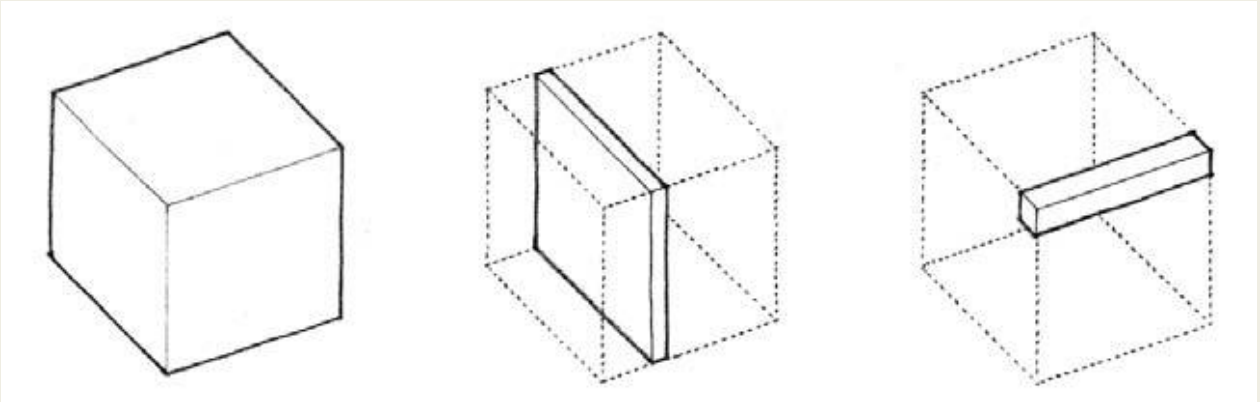


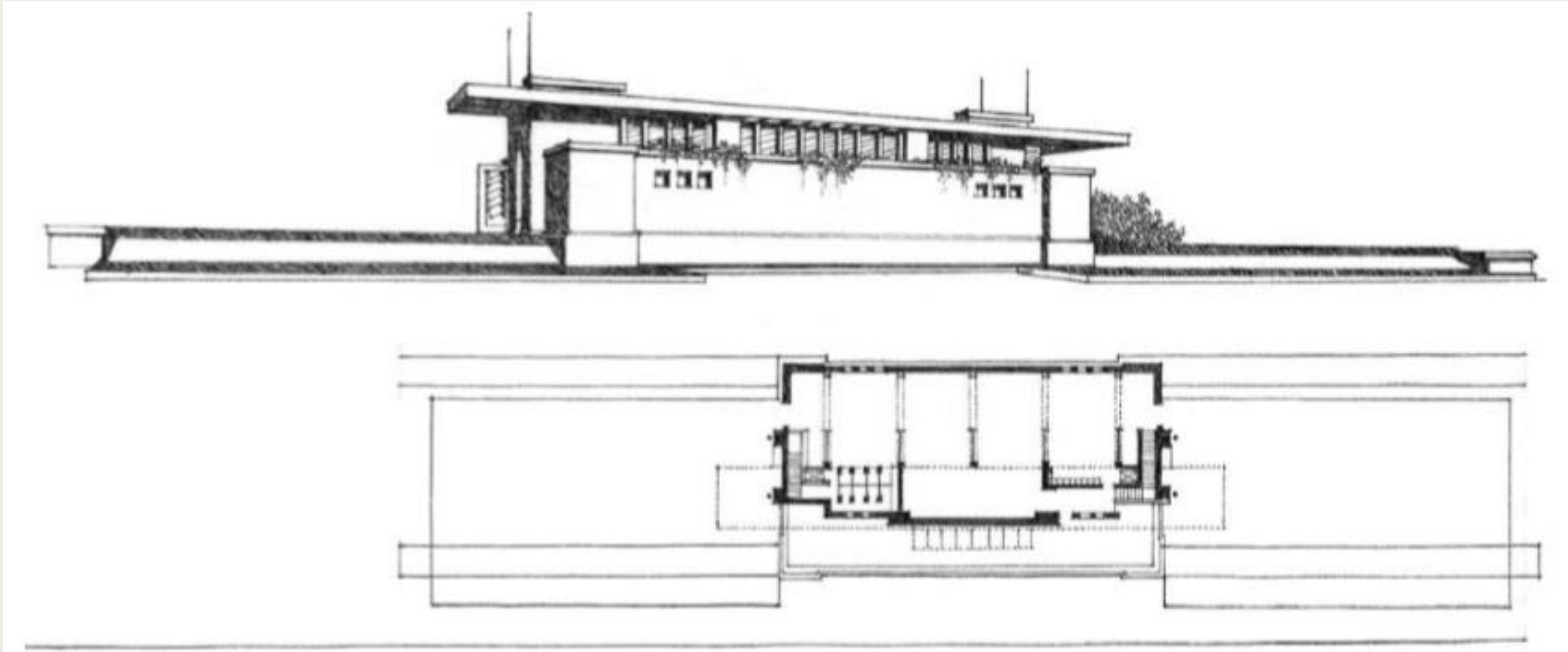
Irregular Forms within a Regular Field:
Courtyard House Project, 1934, Mies van de Rohe

TRANSFORMATION OF FORM

1. Dimensional Transformation

- A form can be transformed by altering one or more of its dimensions and still retain its identity as a member of a family of forms.
- A cube, for example, can be transformed into similar prismatic forms through discrete changes in height, width, or length.
- It can be compressed into a planar form or be stretched out into a linear one.

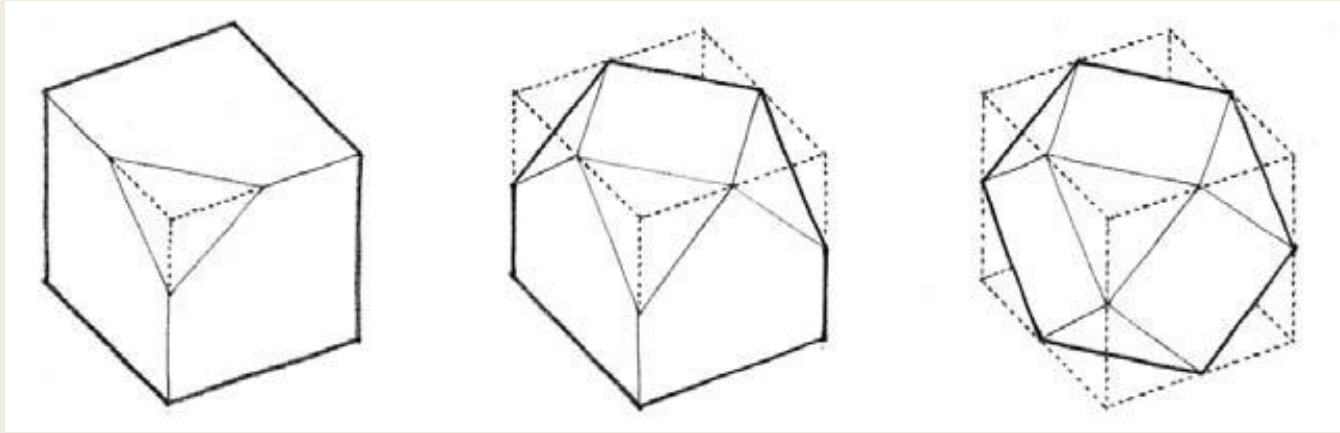


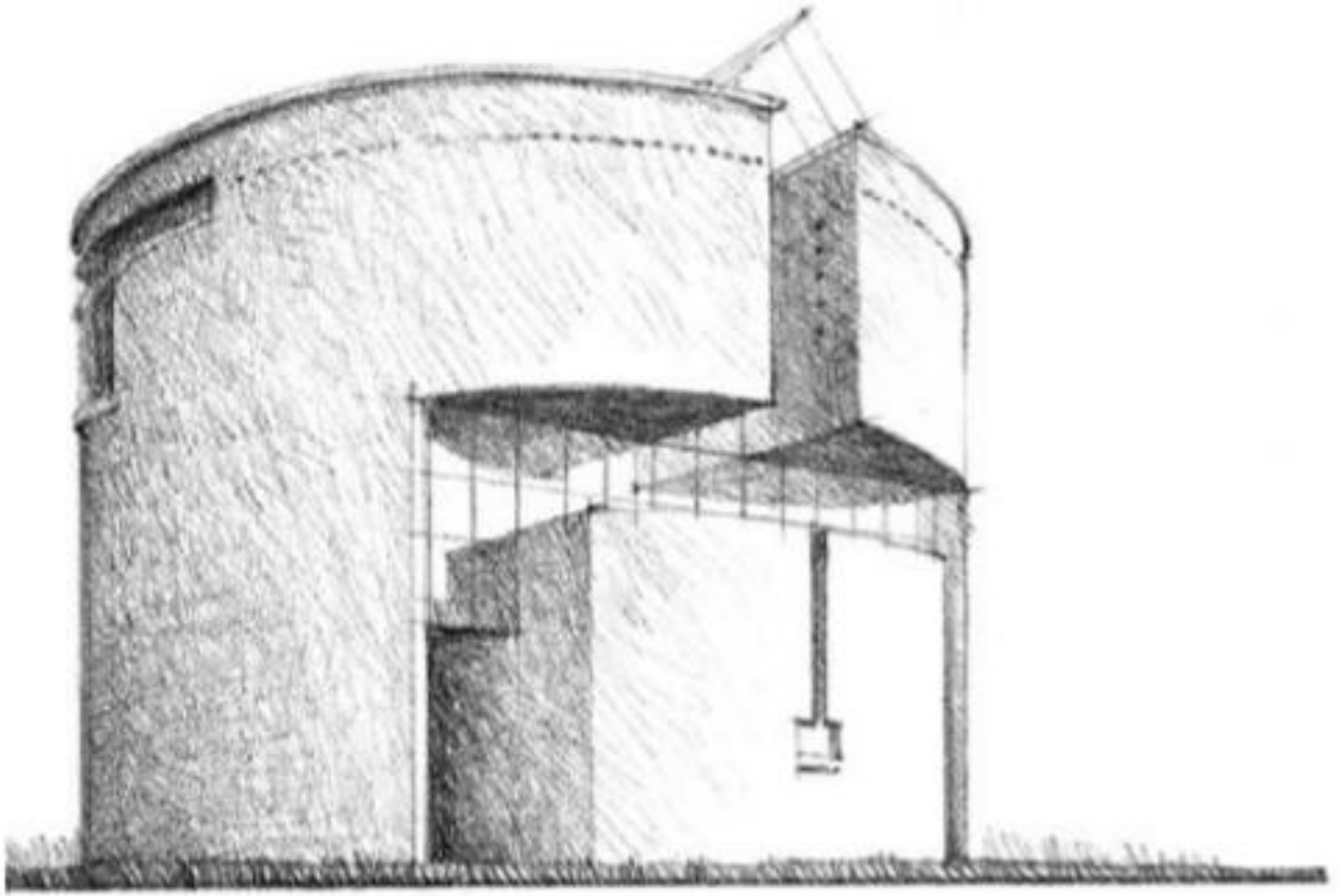


Project for Yahara Boat Club, Madison, Wisconsin, 1902, Frank Lloyd Wright

2. Subtractive Transformation

- A form can be transformed by subtracting a portion of its volume.
- Depending on the extent of the subtractive process, the form can retain its initial identity or be transformed into a form of another family.
- For example, a cube can retain its identity as a cube even though a portion of it is removed,
- or be transformed into a series of regular polyhedrons that begin to approximate a sphere.

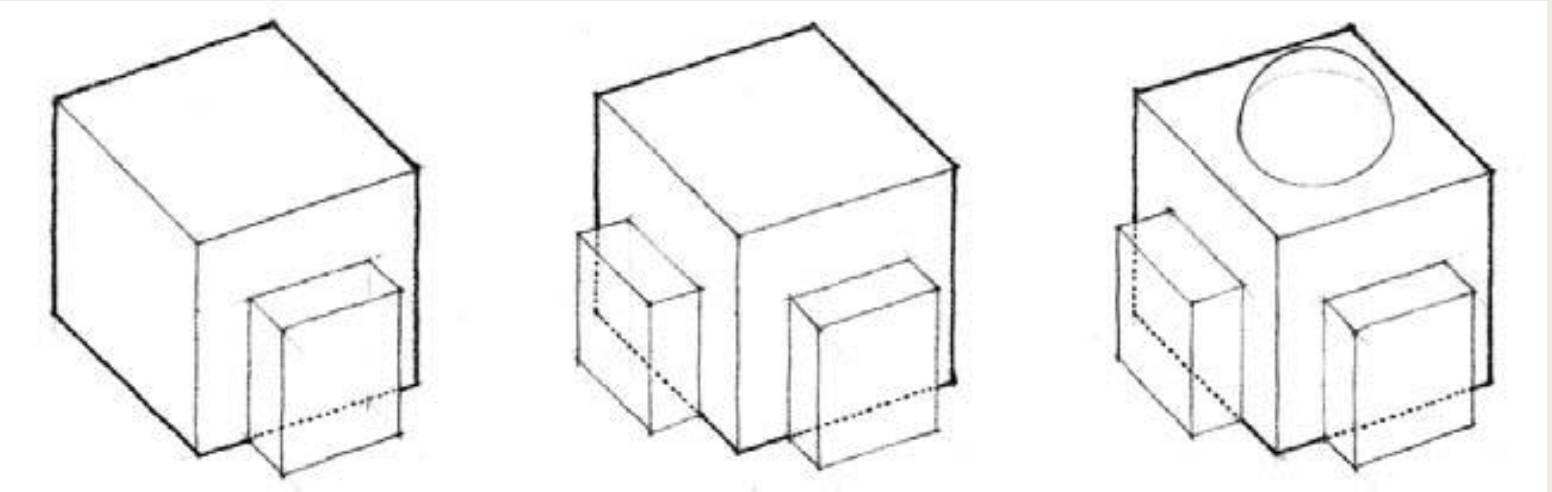




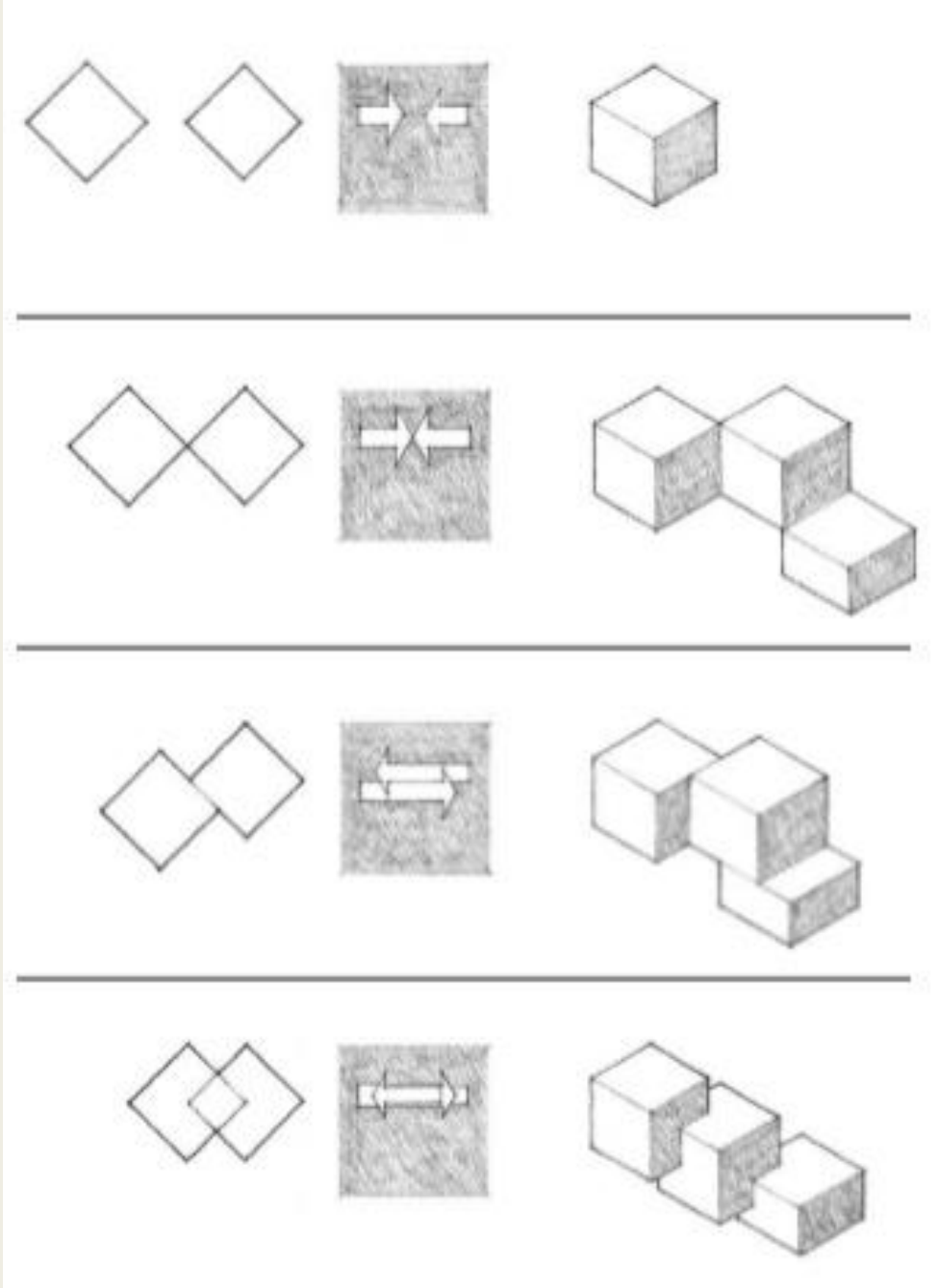
House at Stabio, Switzerland, 1981, Mario Botta

3. Additive Transformation

- A form can be transformed by the addition of elements to its volume.
- The nature of the additive process and the number and relative sizes of the elements being attached determine whether the identity of the initial form is altered or retained.



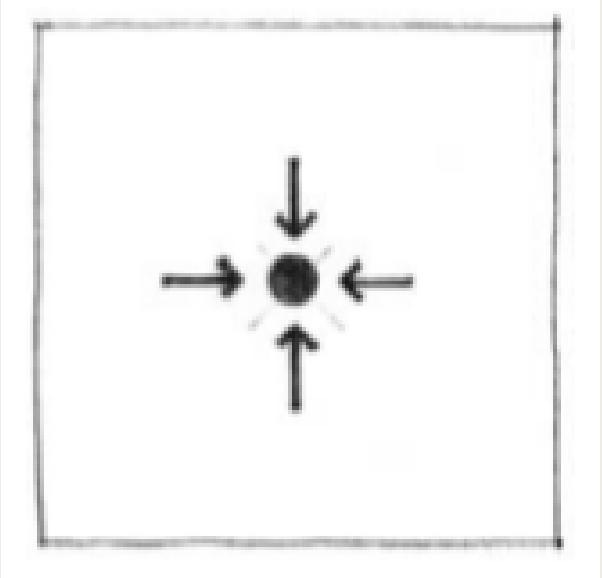
- The basic possibilities for grouping two or more forms are by:
- **Interlocking Volumes** In this type of relationship, the forms interpenetrate each other's space. The forms need not share any visual traits.
- **Face-to-face Contact** This type of relationship requires that the two forms have corresponding planar surfaces which are parallel to each other.
- **Edge-to-edge Contact** In this type of relationship, the forms share a common edge and can pivot about that edge.
- **Spatial Tension** This type of relationship relies on the close proximity of the forms or their sharing of a common visual trait, such as shape, color, or material.



ADDITIVE FORM

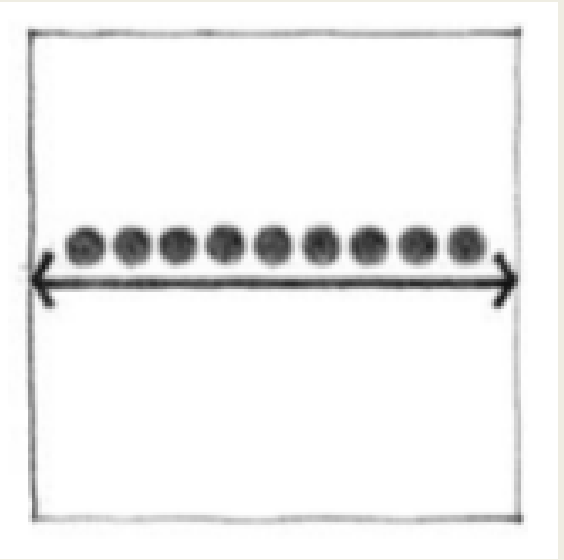
- **Centralized Form**

A number of secondary forms clustered about a dominant, central parent-form



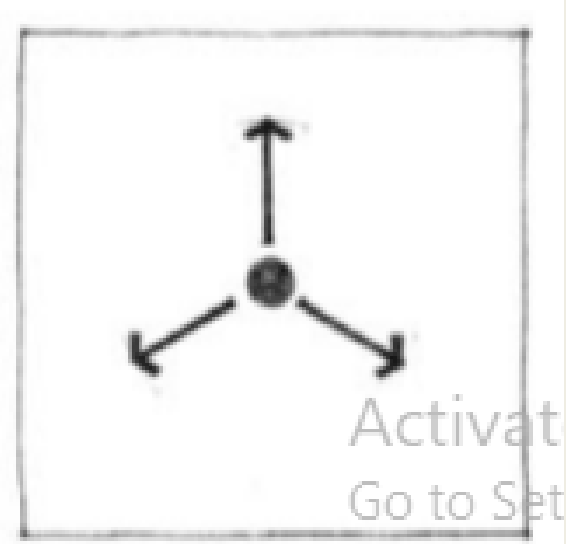
- **Linear Form**

A series of forms arranged sequentially in a row



- **Radial Form**

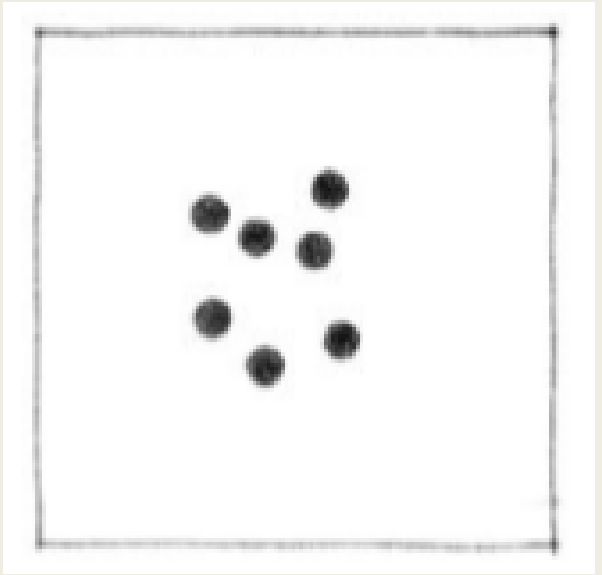
A composition of linear forms extending outward from a central form in a radial manner



ADDITIVE FORM

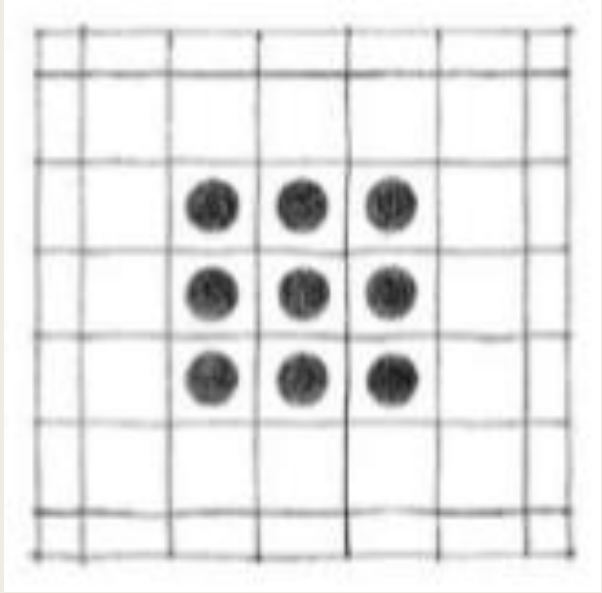
- **Clustered Form**

A collection of forms grouped together by proximity or the sharing of a common visual trait

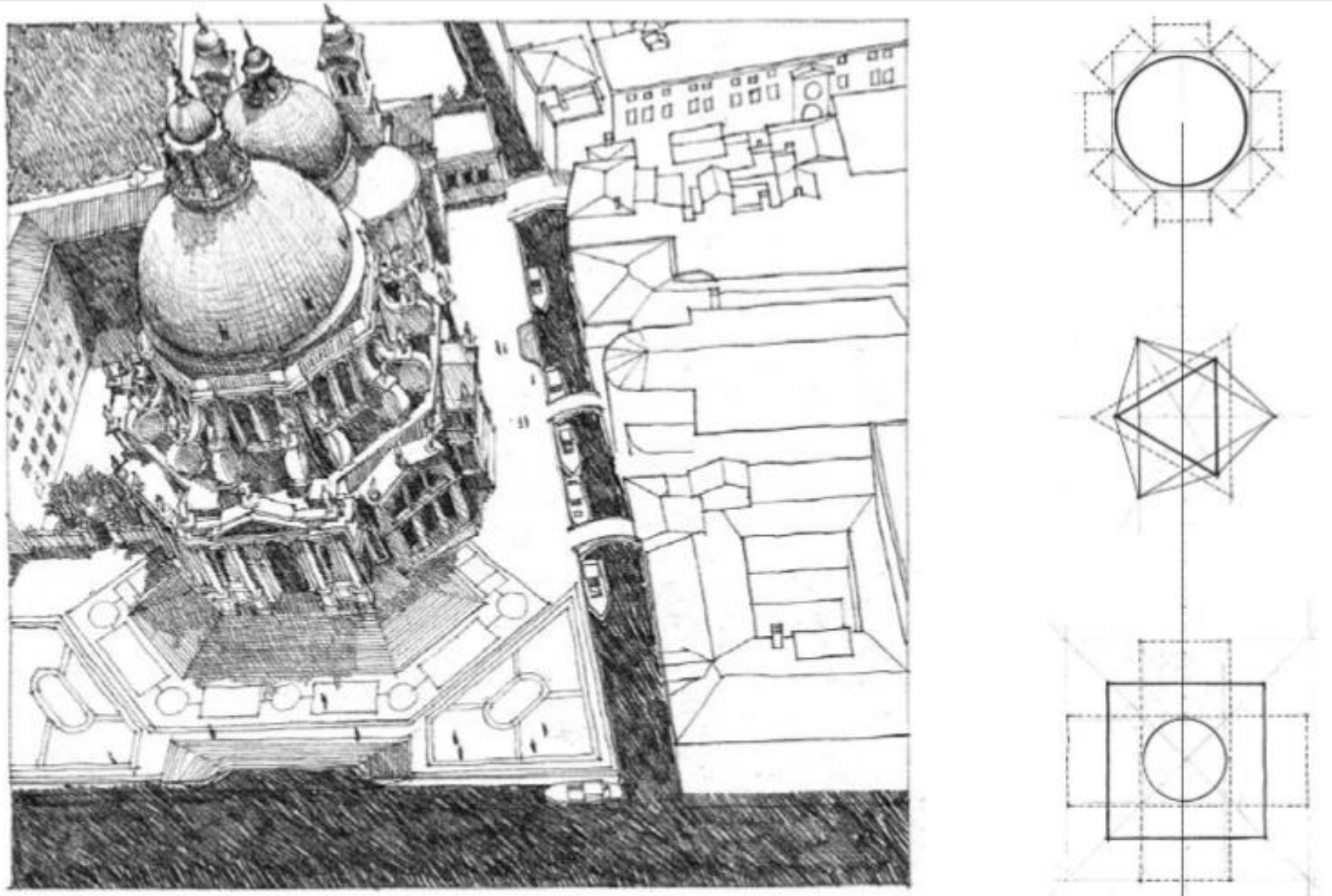


- **Grid Form**

A set of modular forms related and regulated by a three-dimensional grid



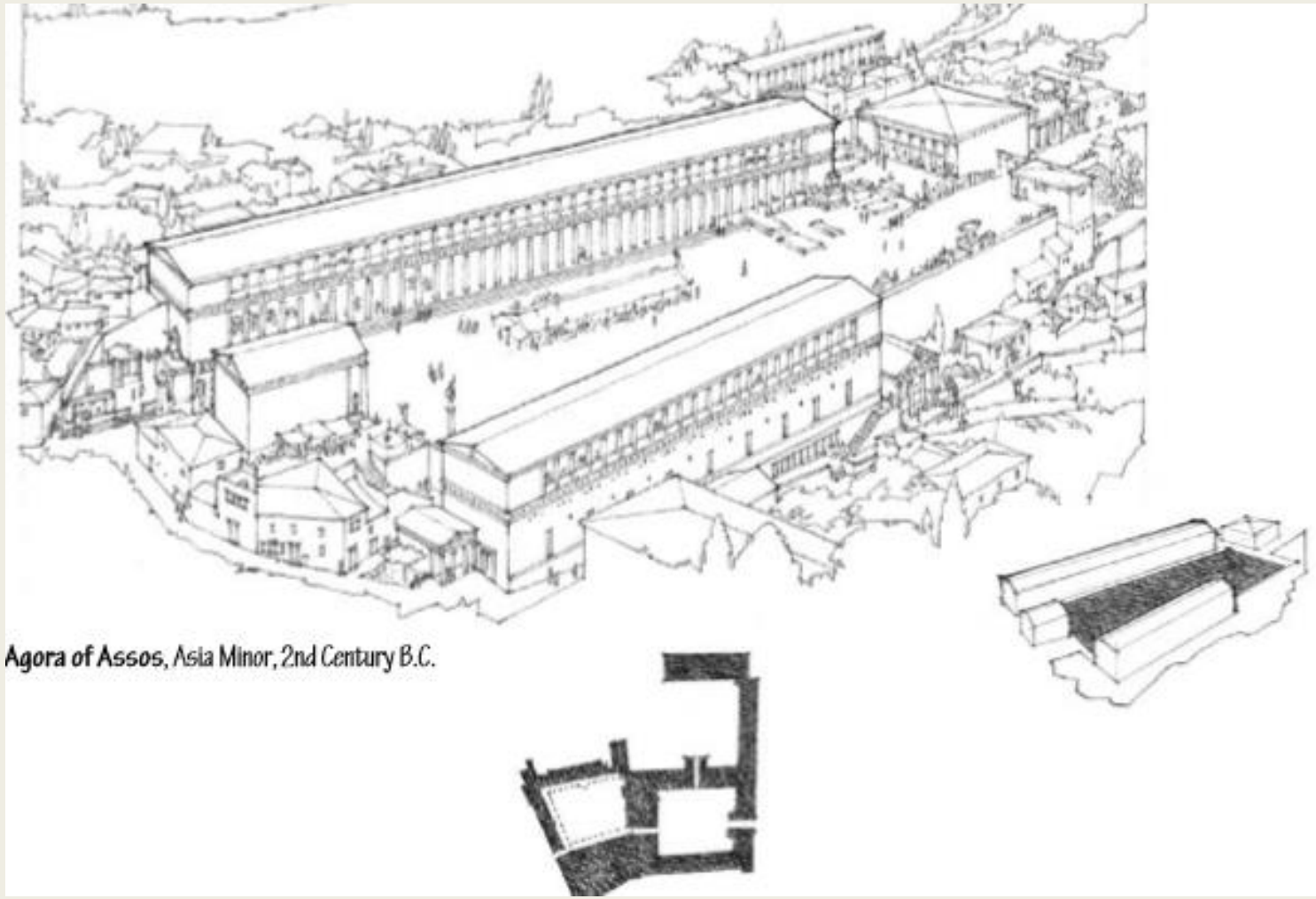
Centralized Form



S. Maria Della Salute, Venice, 1631–82, Baldassare Longhena

Linear form

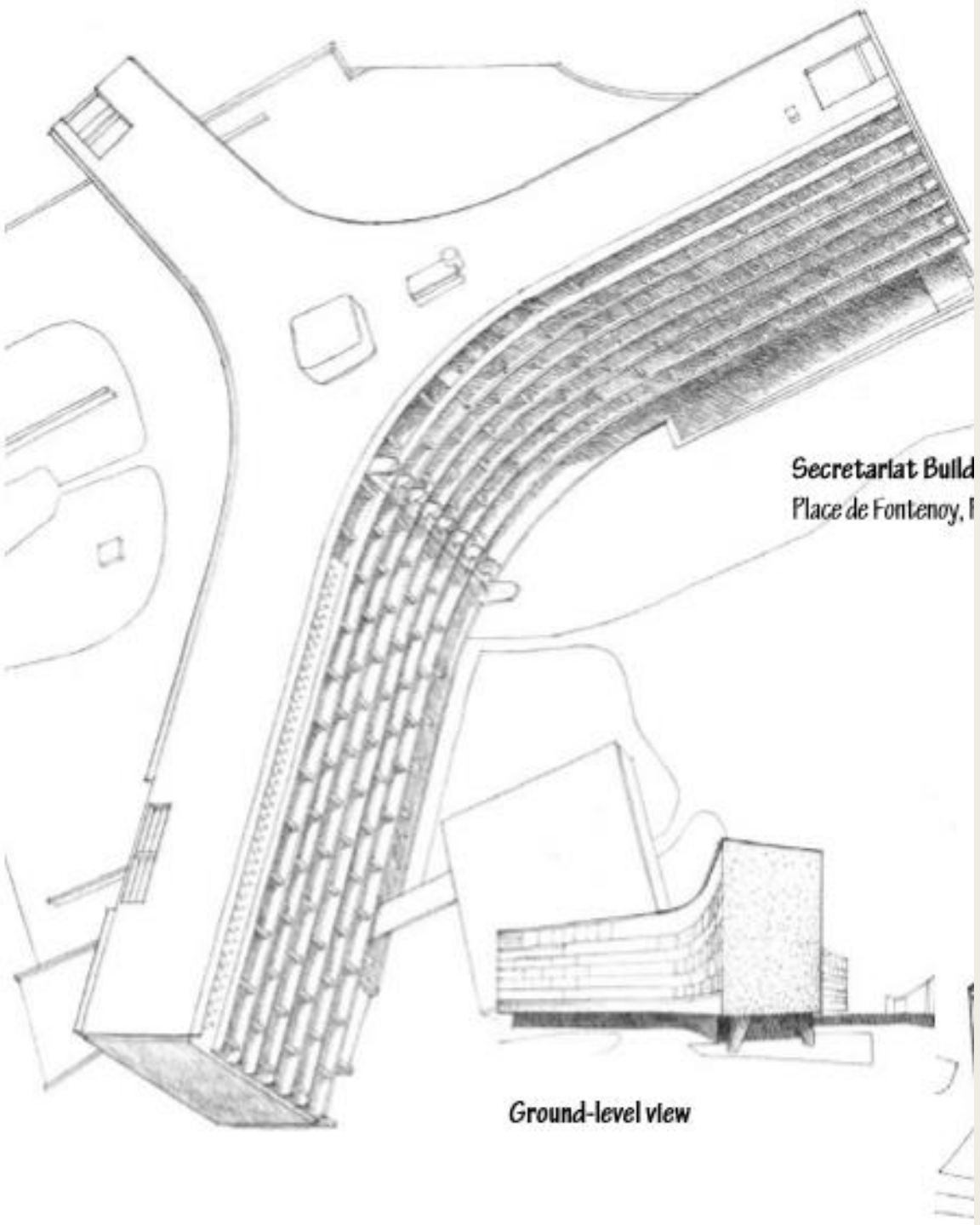
A linear form can result from a proportional change in a form's dimensions or the arrangement of a series of discrete forms along a line

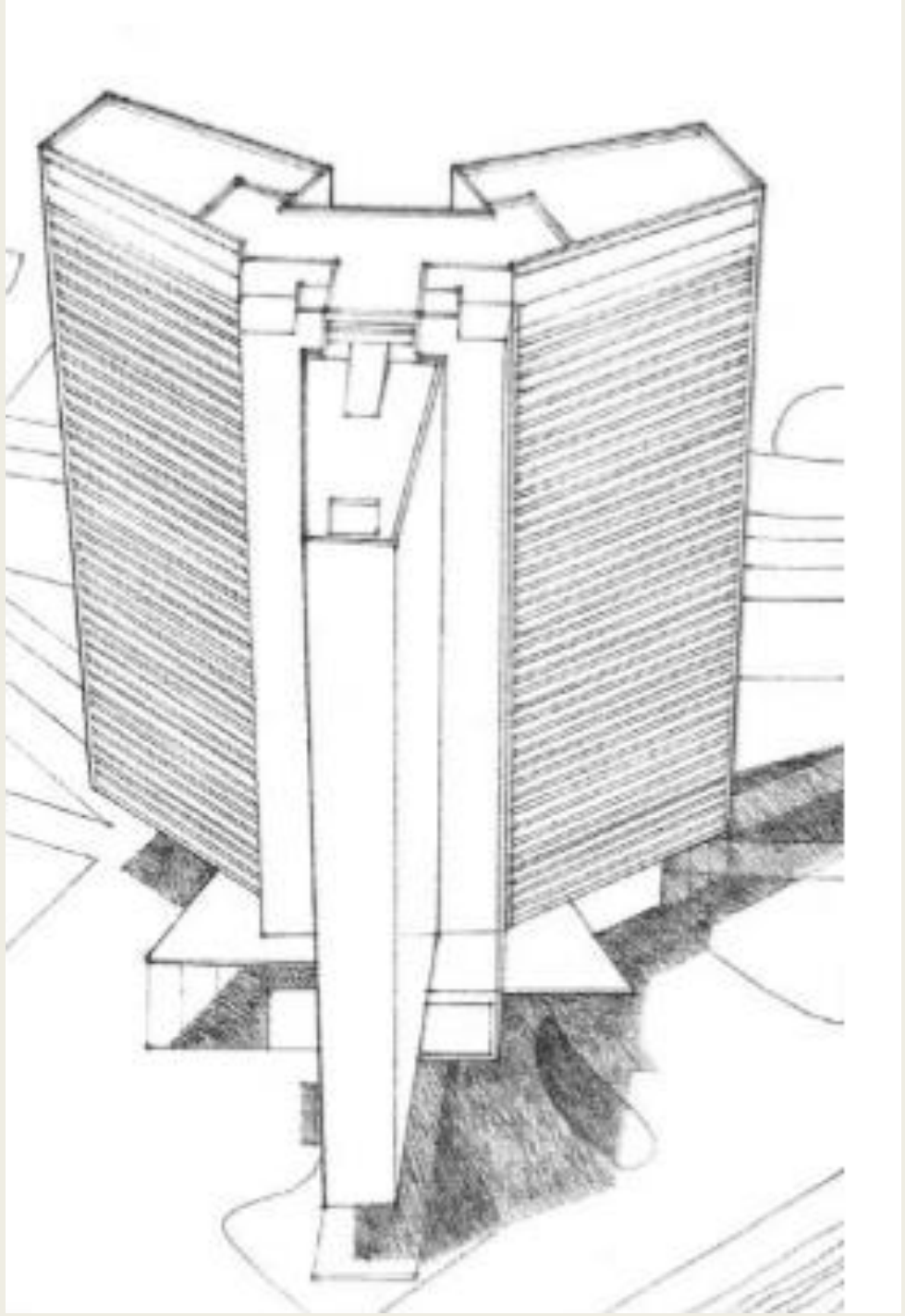


Agora of Assos, Asia Minor, 2nd Century B.C.

Radial form

A radial form consists of linear forms that extend outward from a centrally located core element in a radiating manner. It combines the aspects of centrality and linearity into a single composition.

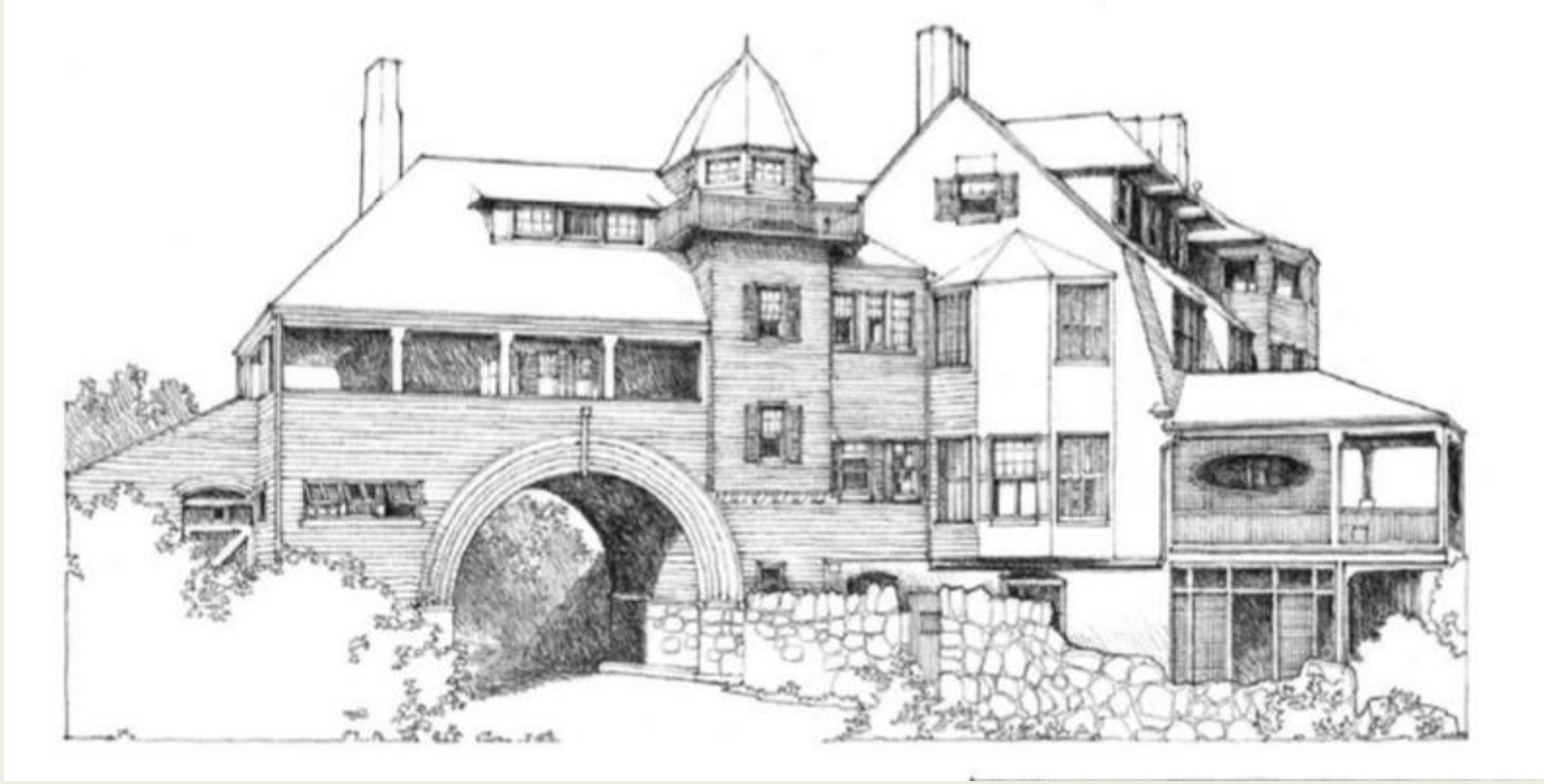




Skyscraper by the Sea, Project for Algiers, 1938, Le Corbusier

CLUSTERED FORM

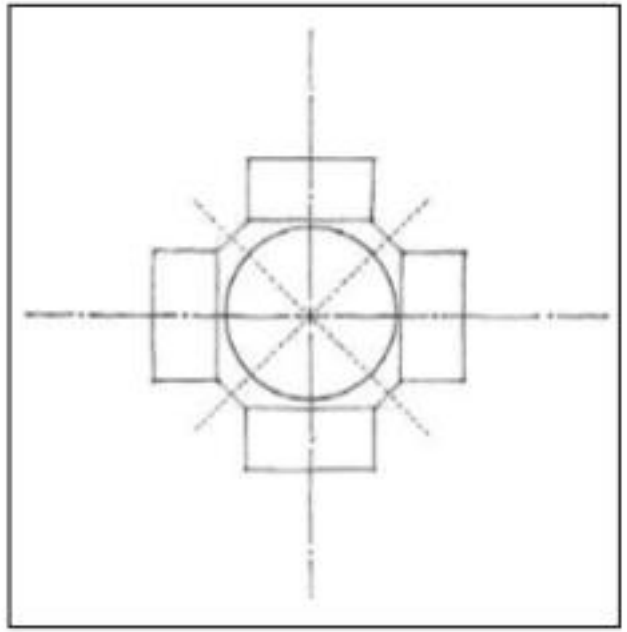
- While a centralized organization has a strong geometric basis for the ordering of its forms, a clustered organization groups its forms according to functional requirements of size, shape, or proximity.

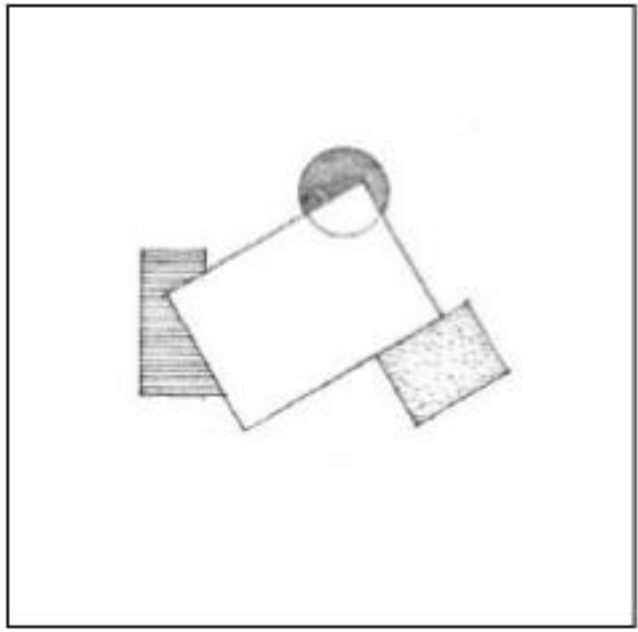


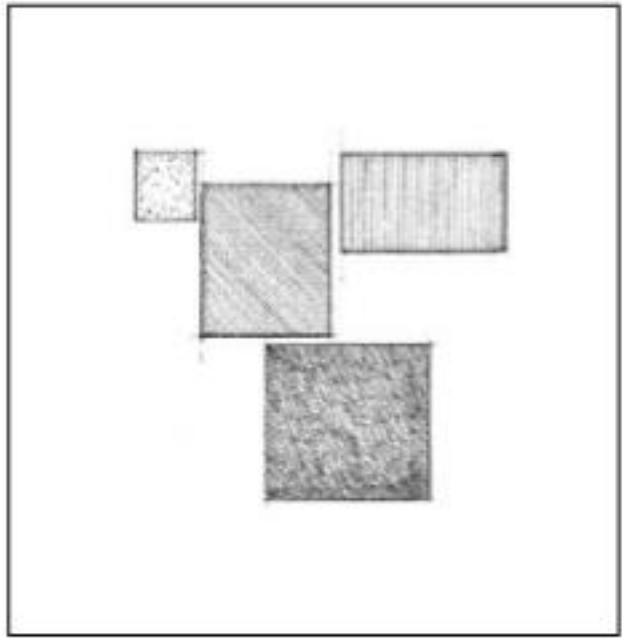
A Cluster of Interlocking Forms: G.N. Black House (Kragsyde), Manchester-by-the Sea, Massachusetts, 1882–83, Peabody & Stearns

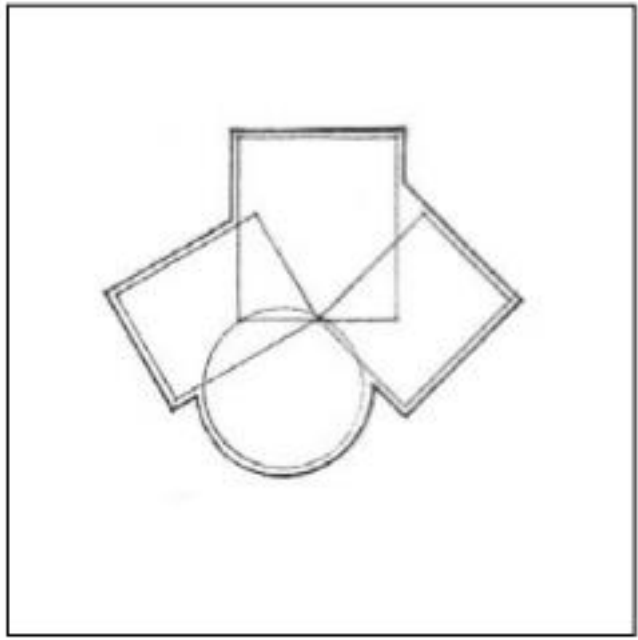
Considering their flexibility, clustered organizations of forms may be organized in the following ways:

- They can be attached as appendages to a larger parent form or space.
- They can be related by proximity alone to articulate and express their volumes as individual entities.
- They can interlock their volumes and merge into a single form having a variety of faces.

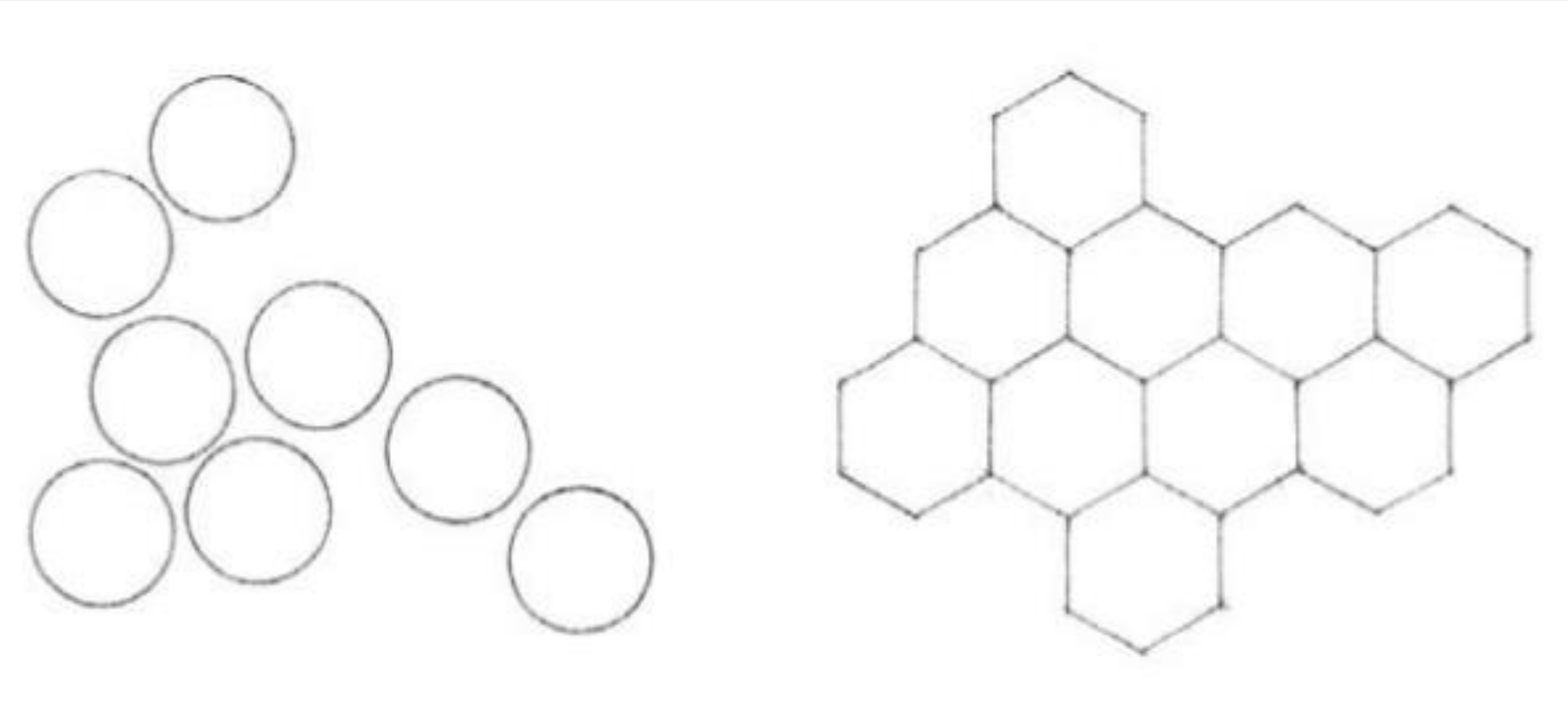


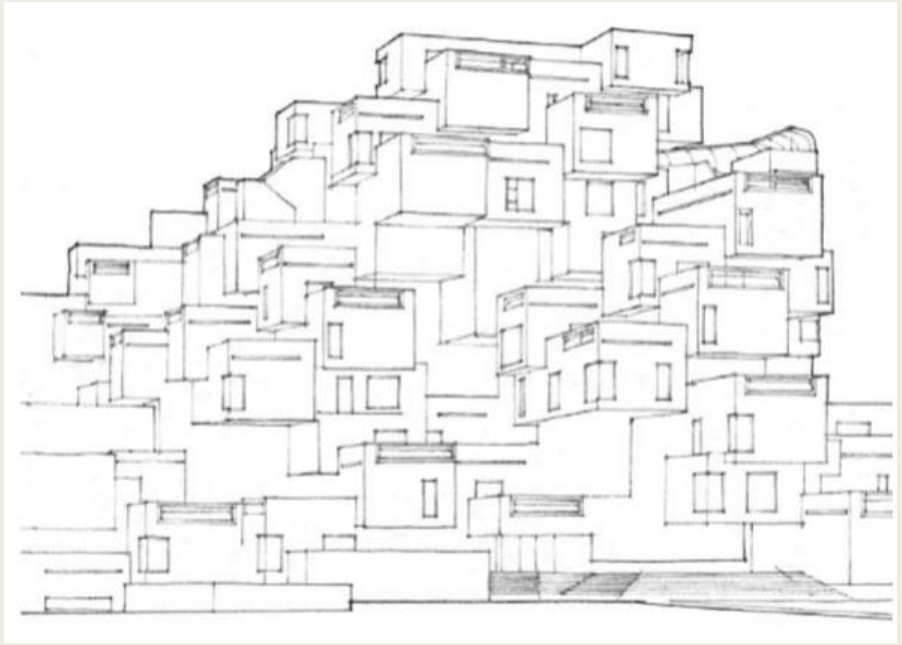


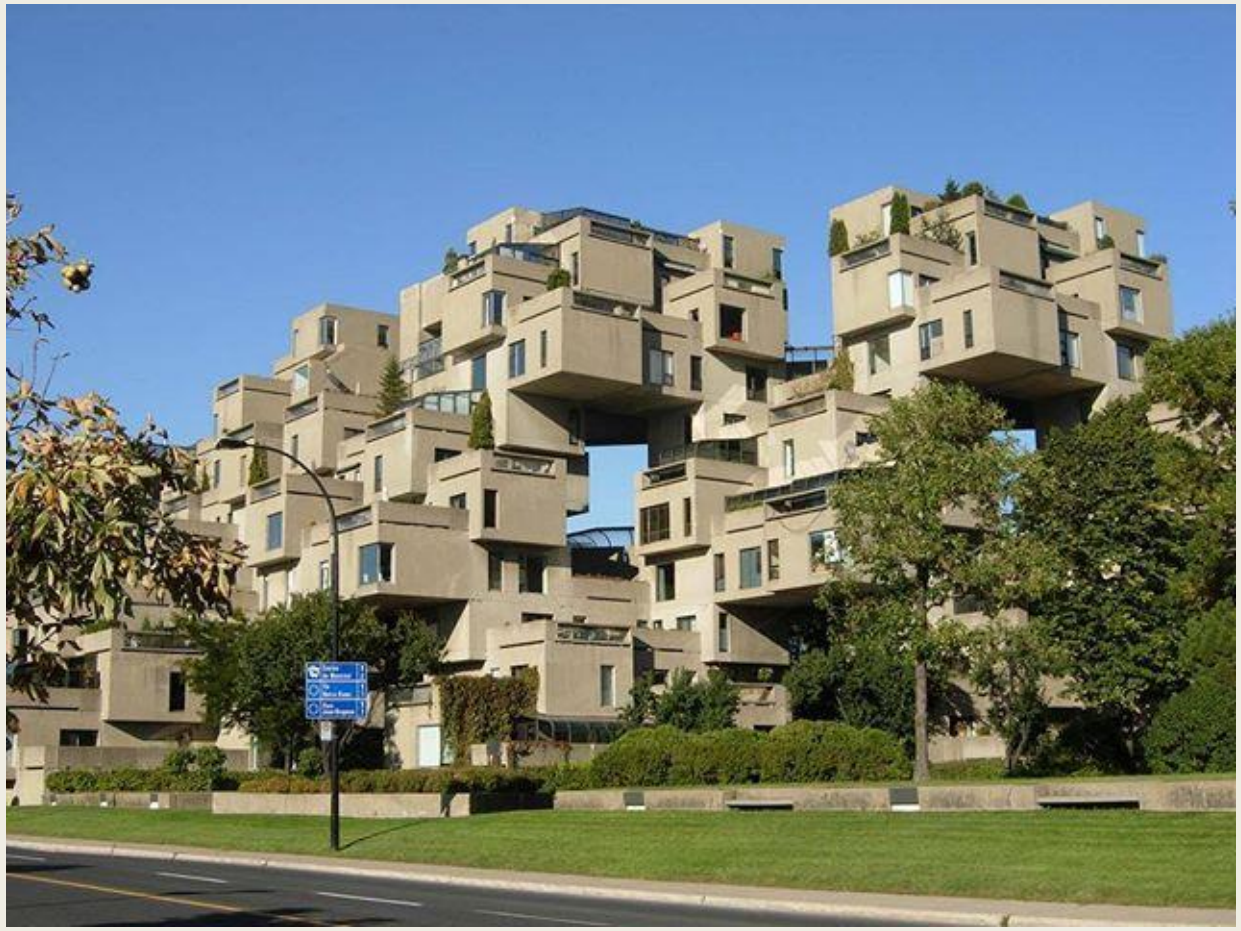




A clustered organization can also consist of forms that are generally equivalent in size, shape, and function





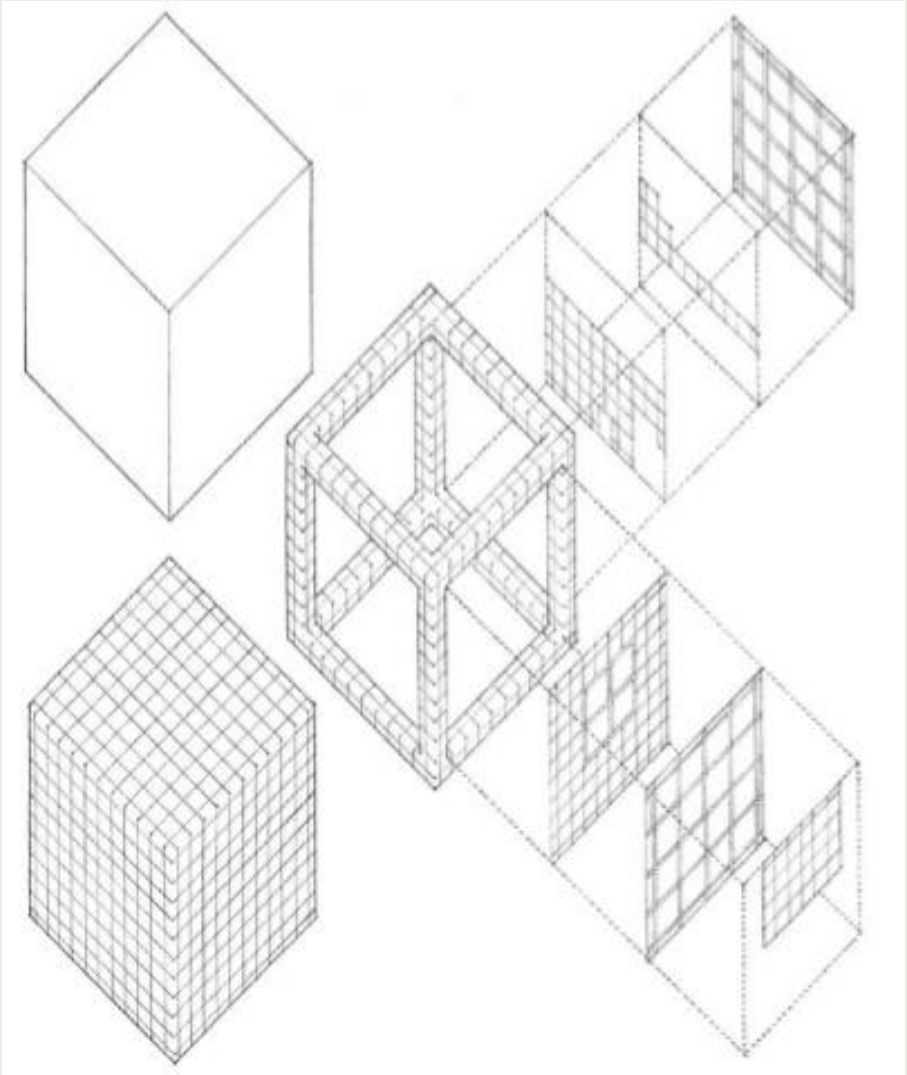


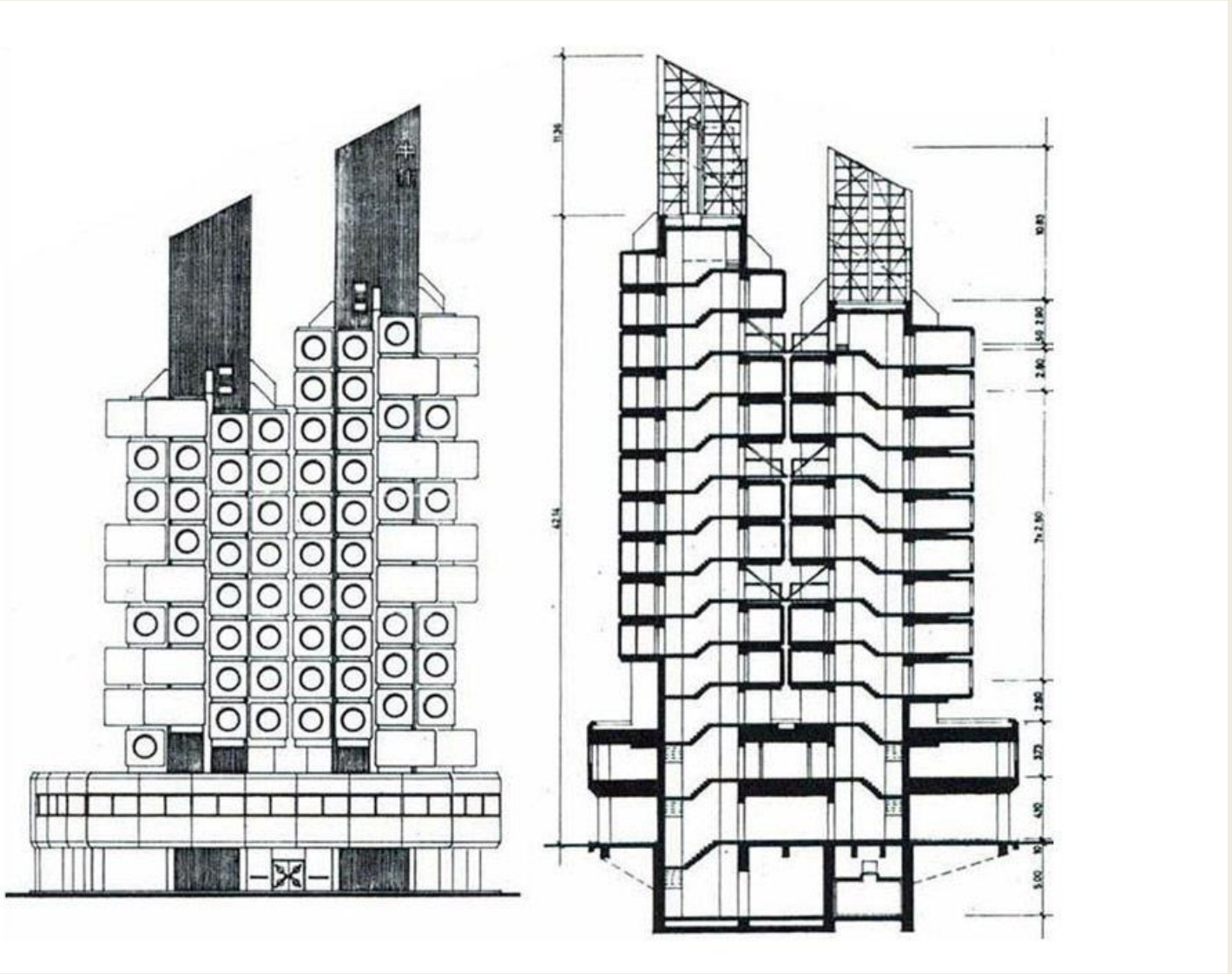
Habitat Montreal, 1967, Moshe Safdie

GRID FORM

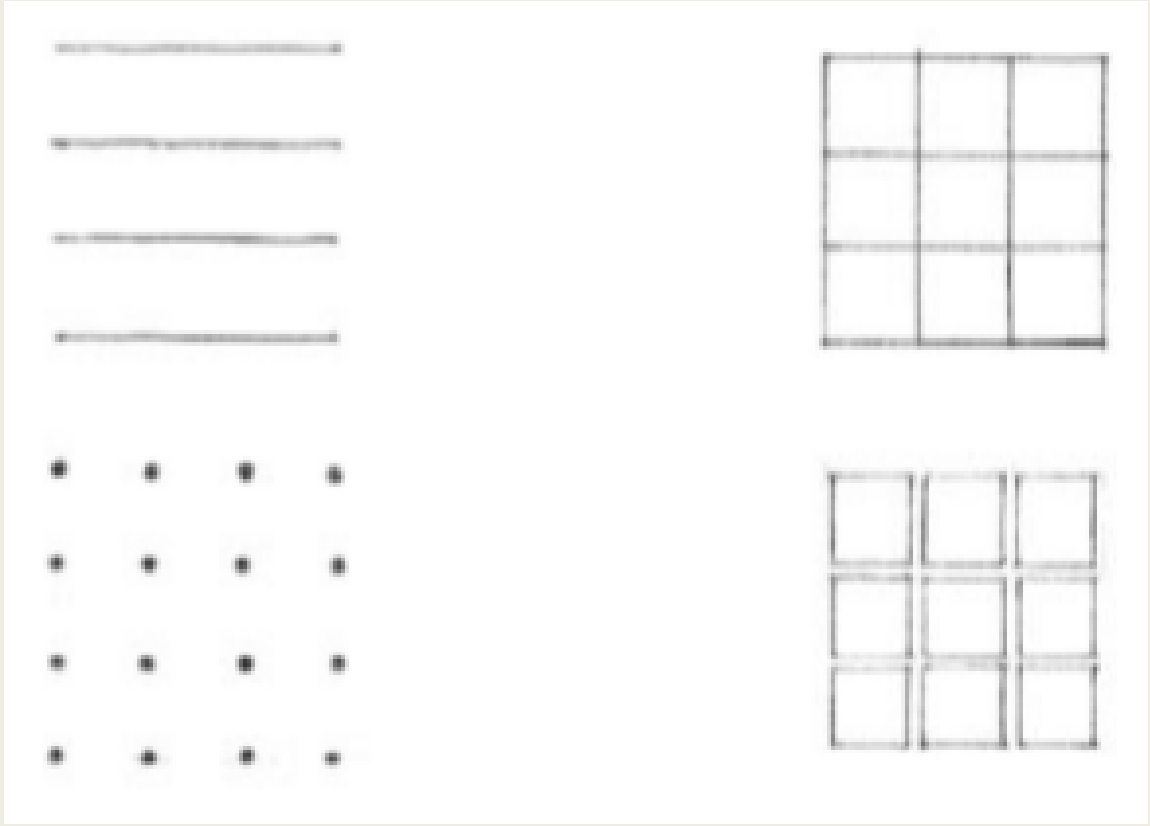
A grid is a system of two or more intersecting sets of regularly spaced parallel lines

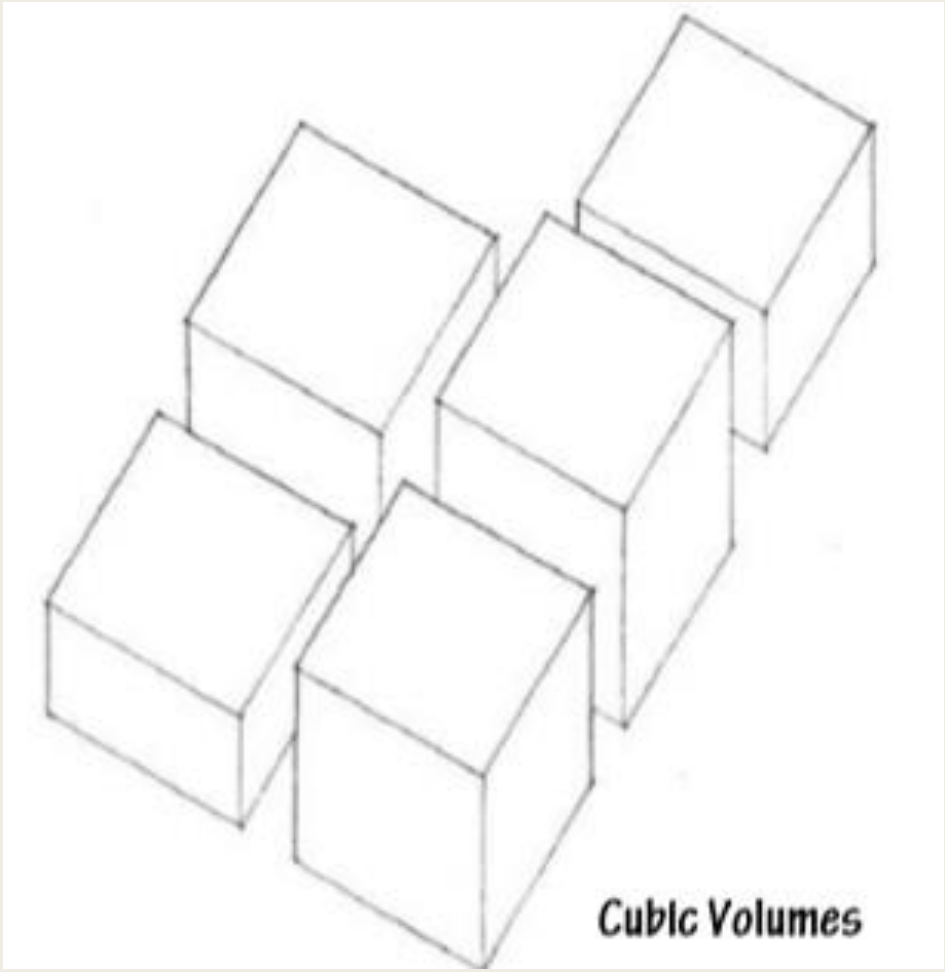
The most common grid is based on the geometry of the square. Because of the equality of its dimensions and its bilateral symmetry,



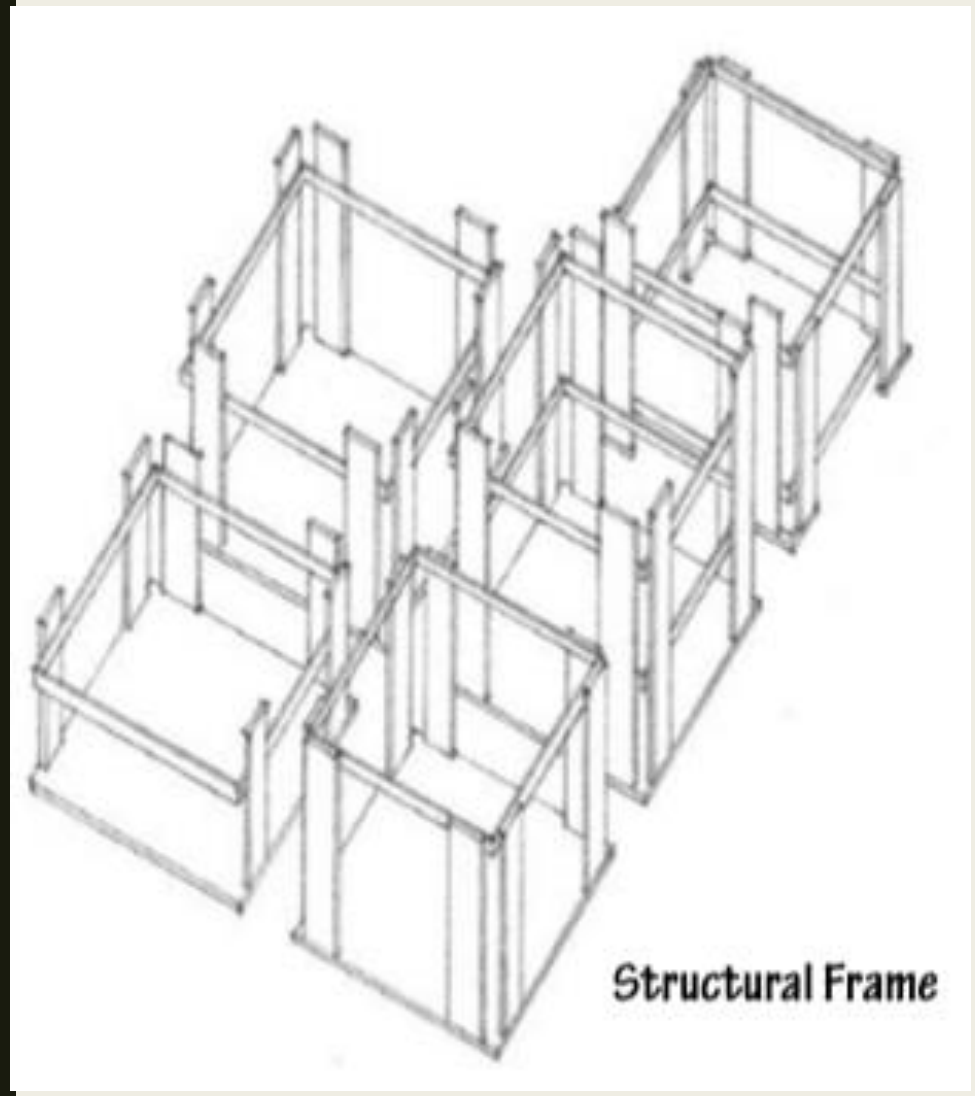


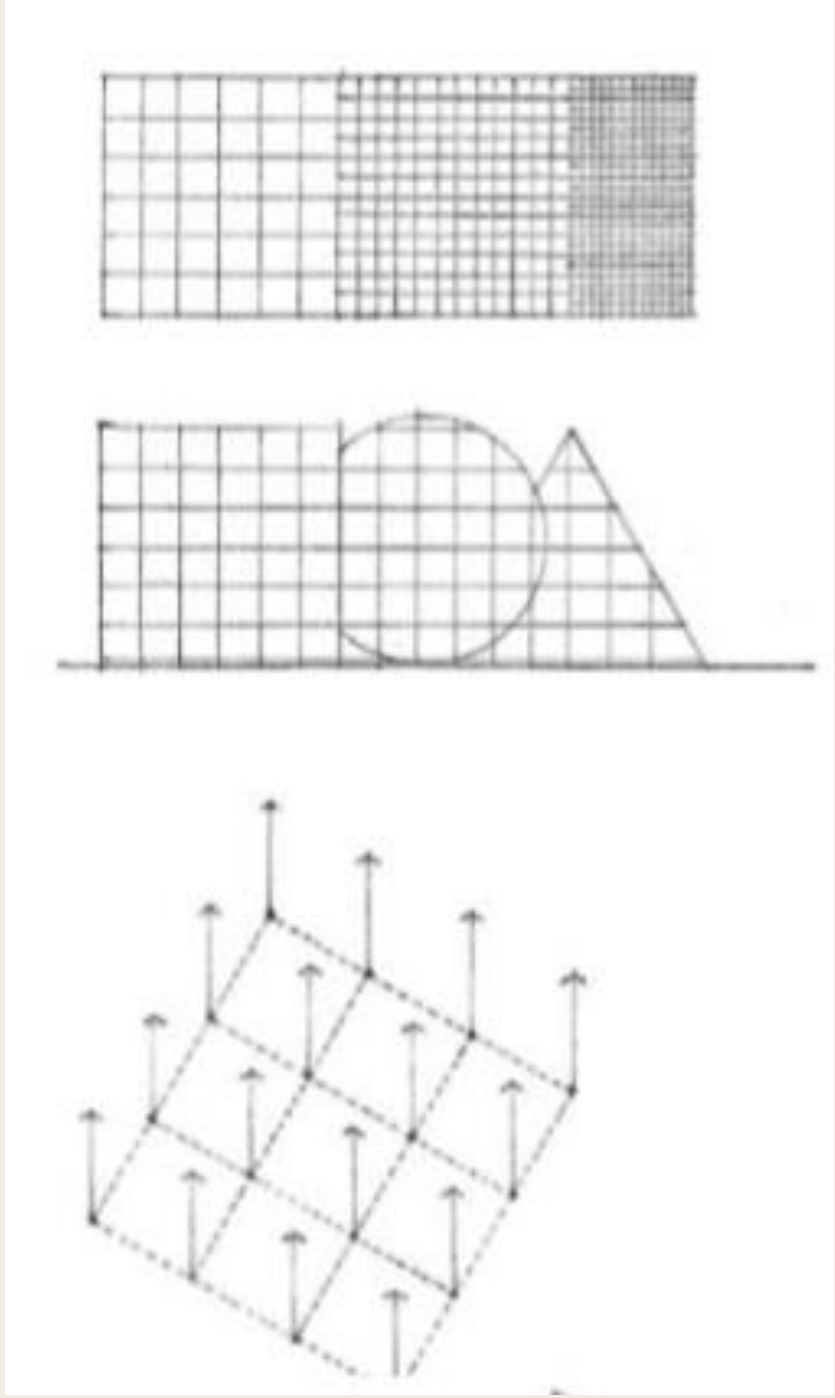
a. Cubic Volumes



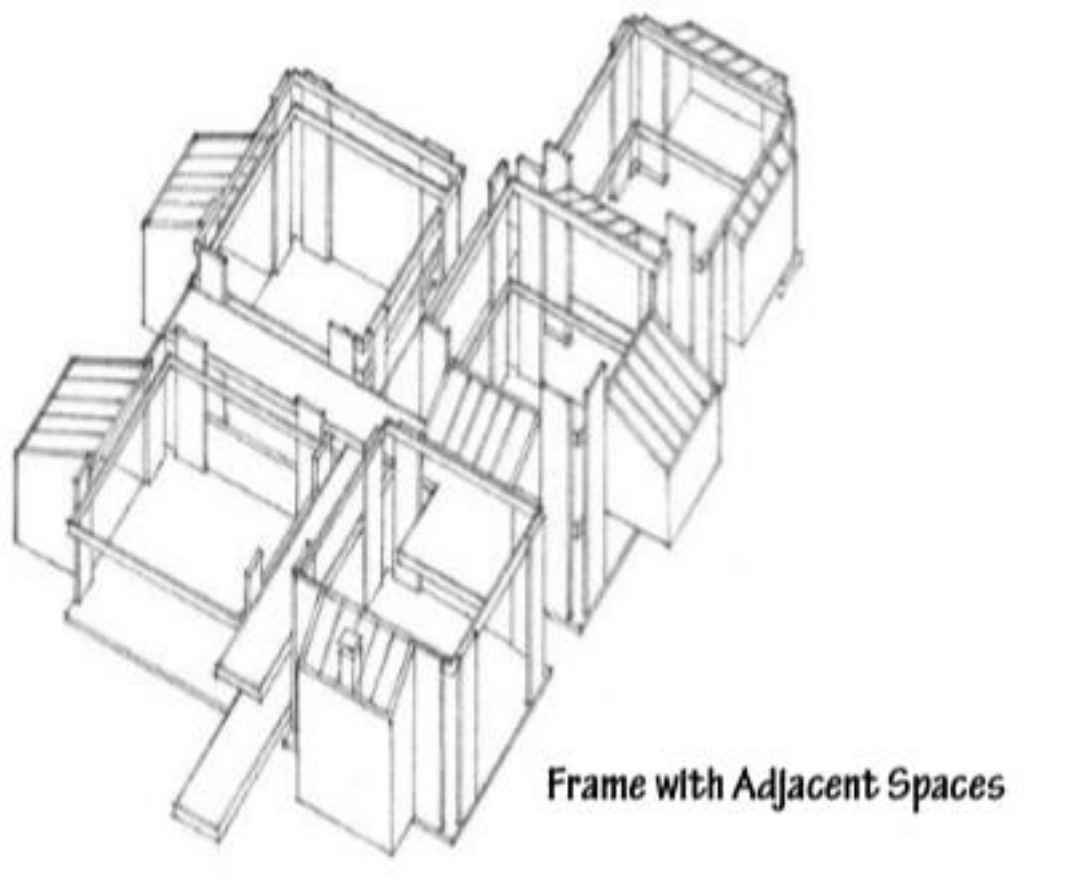


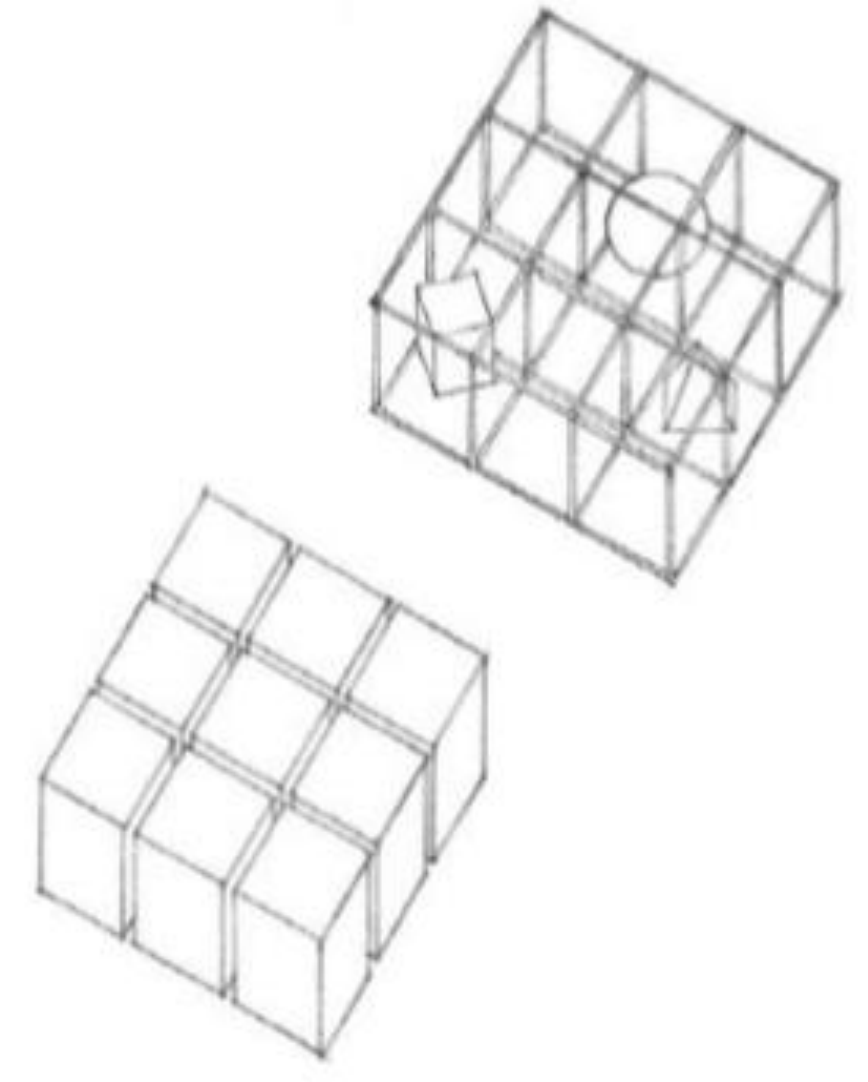
b. Structural Frame





c. Frame with adjacent spaces

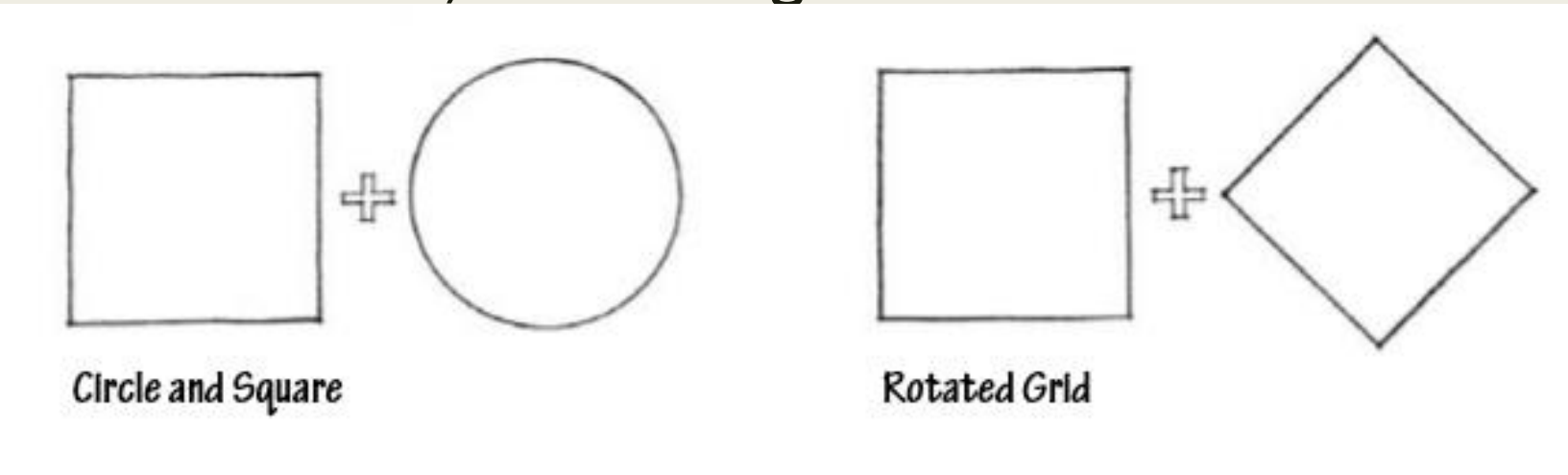




FORMAL COLLISIONS OF GEOMETRY

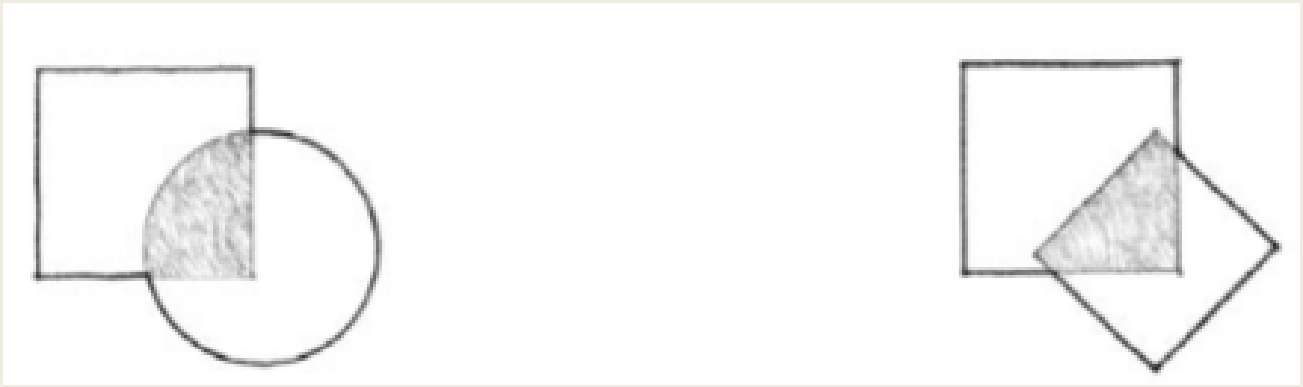
When two forms differing in geometry or orientation interpenetrate each other's boundaries, each will vie for visual dominance.

In these situations, the following forms can evolve:

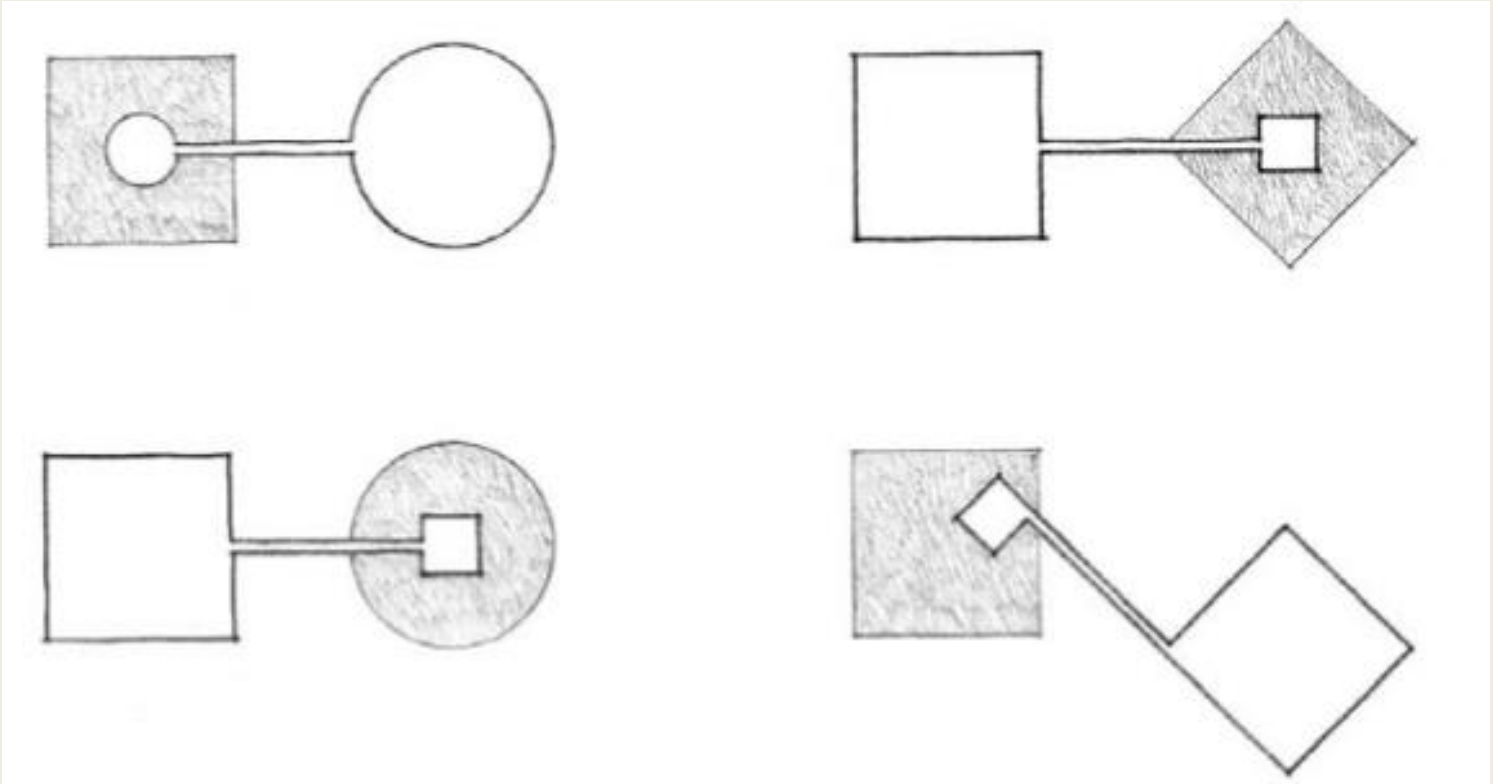


- The two forms can subvert their individual identities and merge to create a new composite form.

- One of the two forms can receive the other totally within its volume

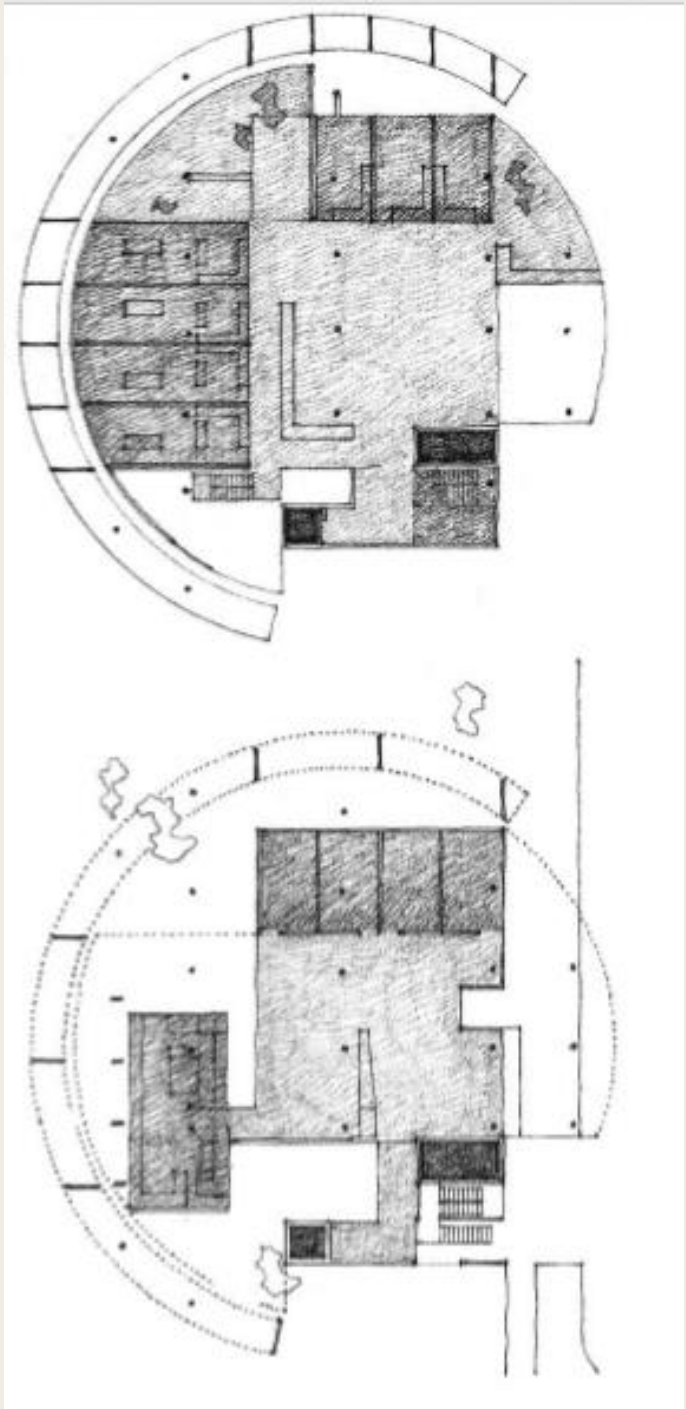


- The two forms can separate and be linked by a third element that recalls the geometry of one of the original forms.

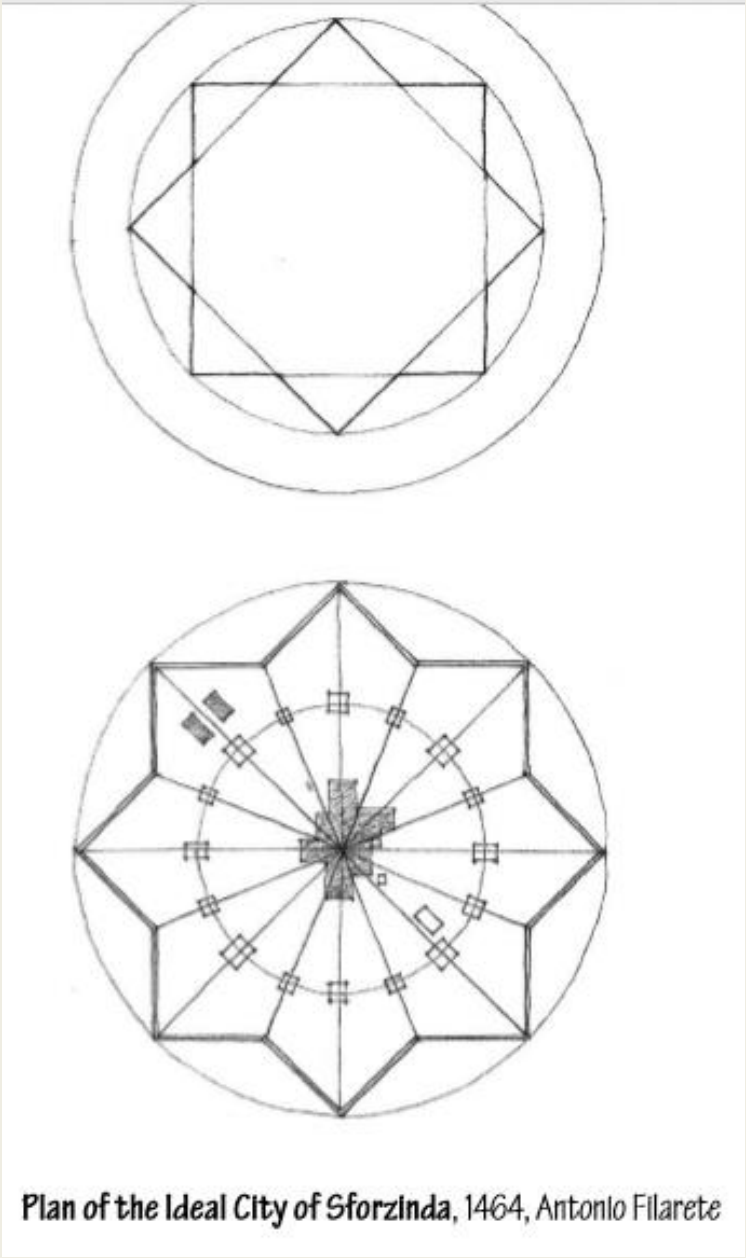


Circle and square

Plan for an Ideal City, 1615, Vincenzo Scamozzi



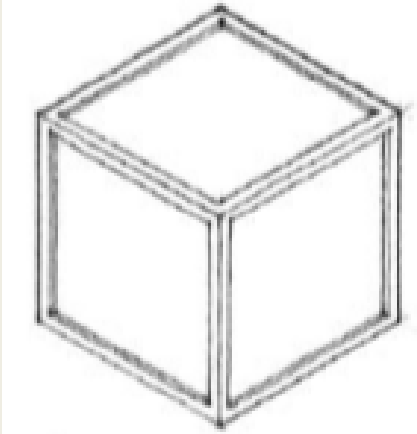
ROTATED GRID



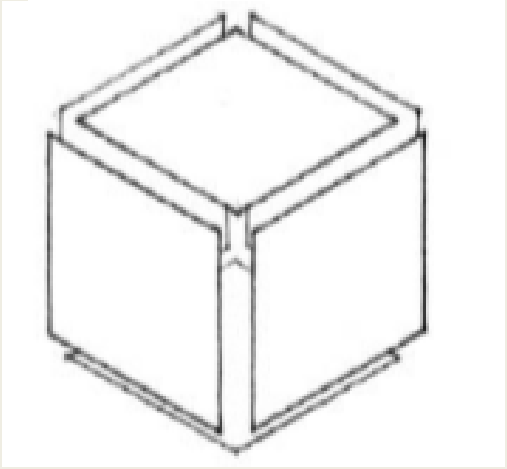
Plan of the Ideal City of Sforzinda, 1464, Antonio Filarete

A form can be articulated by:

Differentiating adjoining planes with a change in material, color, texture, or pattern

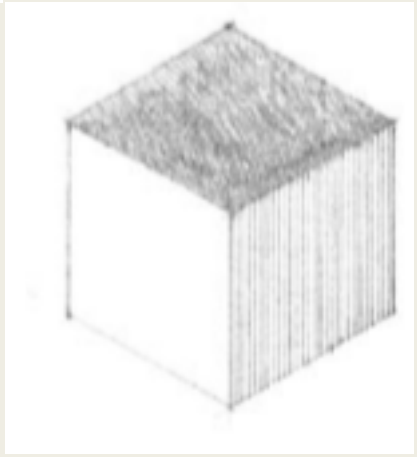


Developing corners as distinct linear elements independent of the abutting planes



removing corners to physically separate neighboring planes

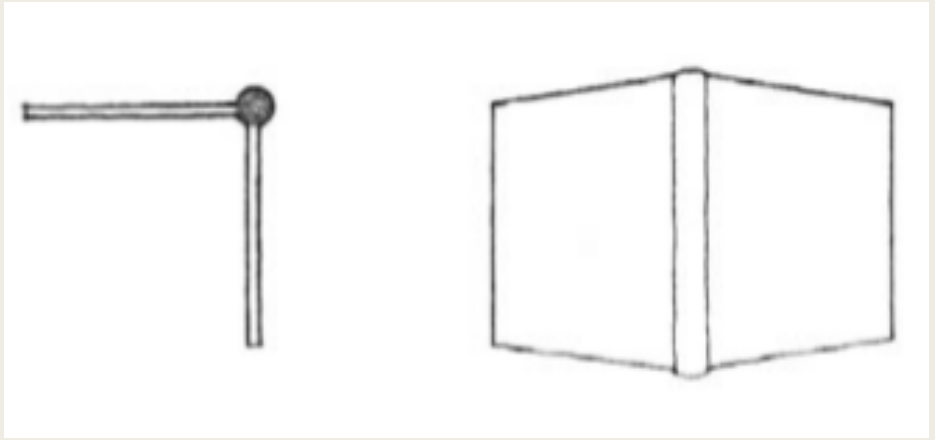
lighting the form to create sharp contrasts in tonal value along edges and corners



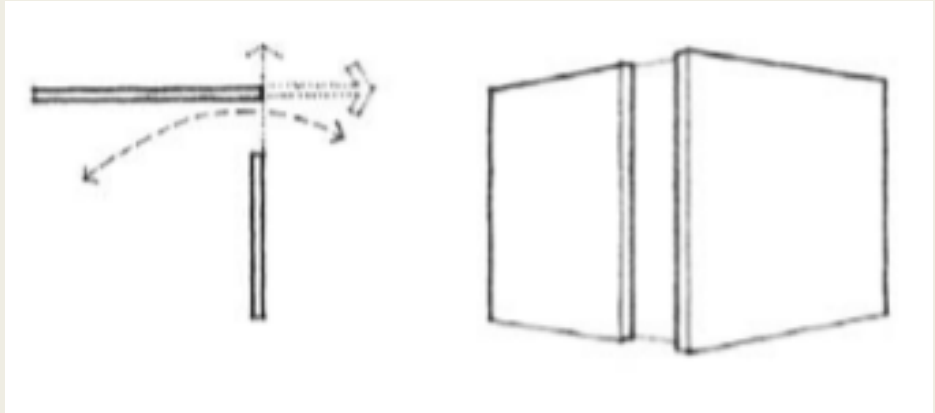
Corners

Corners define the meeting of two planes

A corner condition can be visually reinforced by introducing a separate and distinct element that is independent of the surfaces it joins

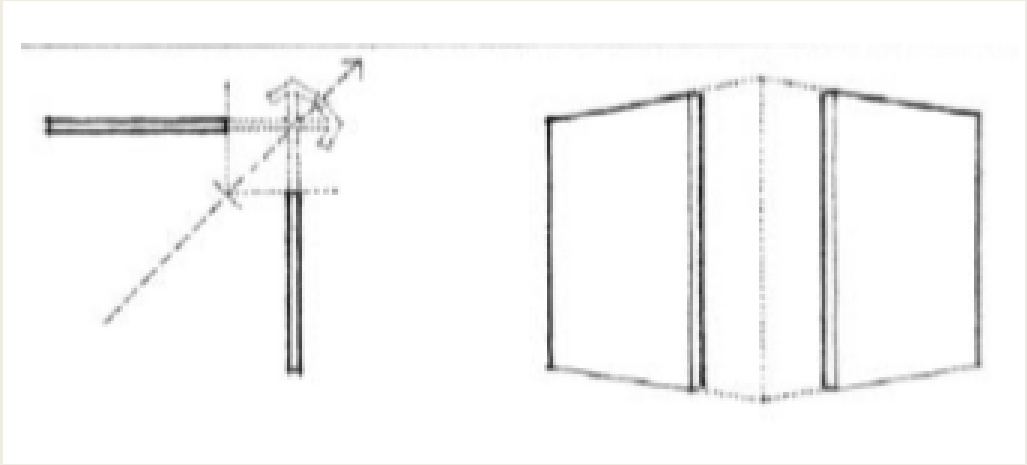


If an opening is introduced to one side of the corner, one of the planes will appear to bypass the other.

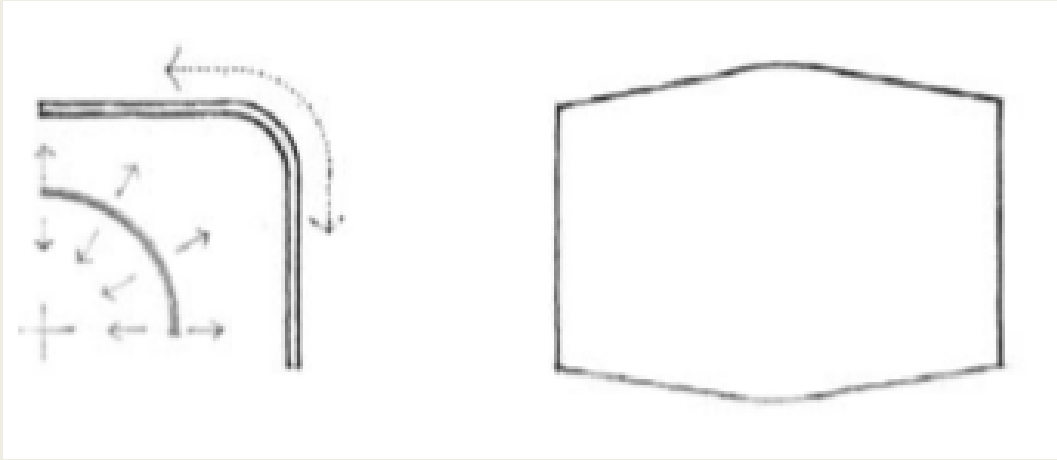


Corners

- If neither plane is extended to define the corner, a volume of space is created to replace the corner.



- Rounding off the corner emphasizes the continuity of the bounding surfaces of a form, the compactness of its volume, and softness of its contour



Reference

- Ching, Frank, (1943). Architecture form, space and order.