Bugün: 02.Eylül.2025

Yaratıcı Kodlamaya devam

Kompleks şekilleri kodlamak

Transformation Matriks işlemleri

Yaratıcı Kodlama ile kompleks şekil üretmek

Geometrik **Desenler**

İslam Sanatı Geometri Desenleri

İslam sanatındaki geometrik tasarımlar, çok çeşitli mozaikler de dahil olmak üzere karmaşık ve karmaşık desenler oluşturmak için arabeskler (genellikle birleştirilirler) gibi üst üste bindirilip iç içe geçebilen tekrarlanan kareler ve dairelerin kombinasyonları üzerine kuruludur.

İslam sanatı, ibadet nesnesi haline gelmemek için çoğunlukla figüratif imgelerden kaçınır. İslam kültüründeki bu anikonizm, sanatçıların figürsüz sanatı keşfetmesine neden oldu ve matematiksel temelli dekorasyona doğru genel bir estetik kayma yarattı.

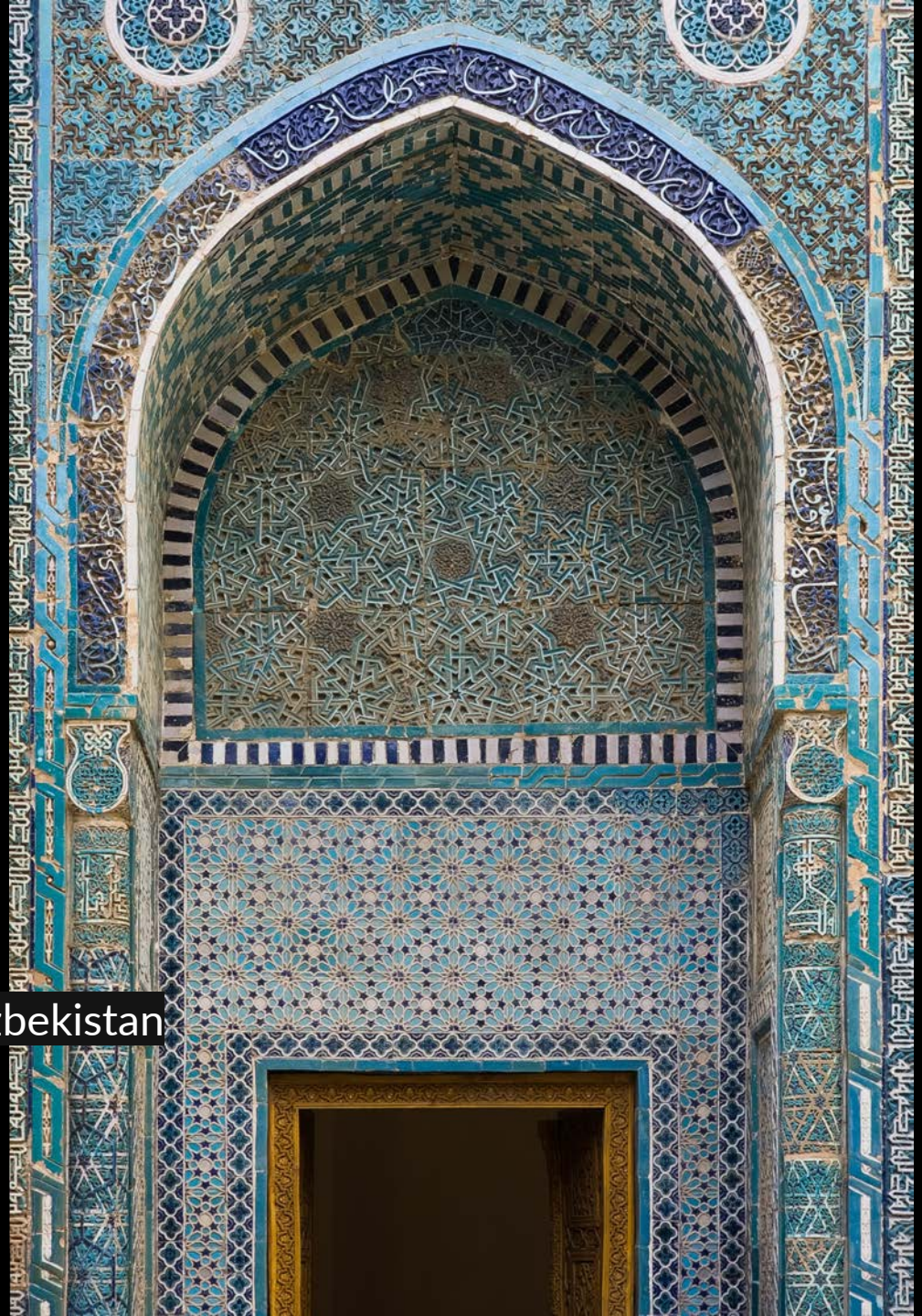
İslam kültüründe desenlerin manevi aleme köprü, zihni ve ruhu arındırma aracı olduğuna inanılır.

Yezd, Pers Jame Camii'nin içindeki fayanslar, geometrik ve bitkisel desenler

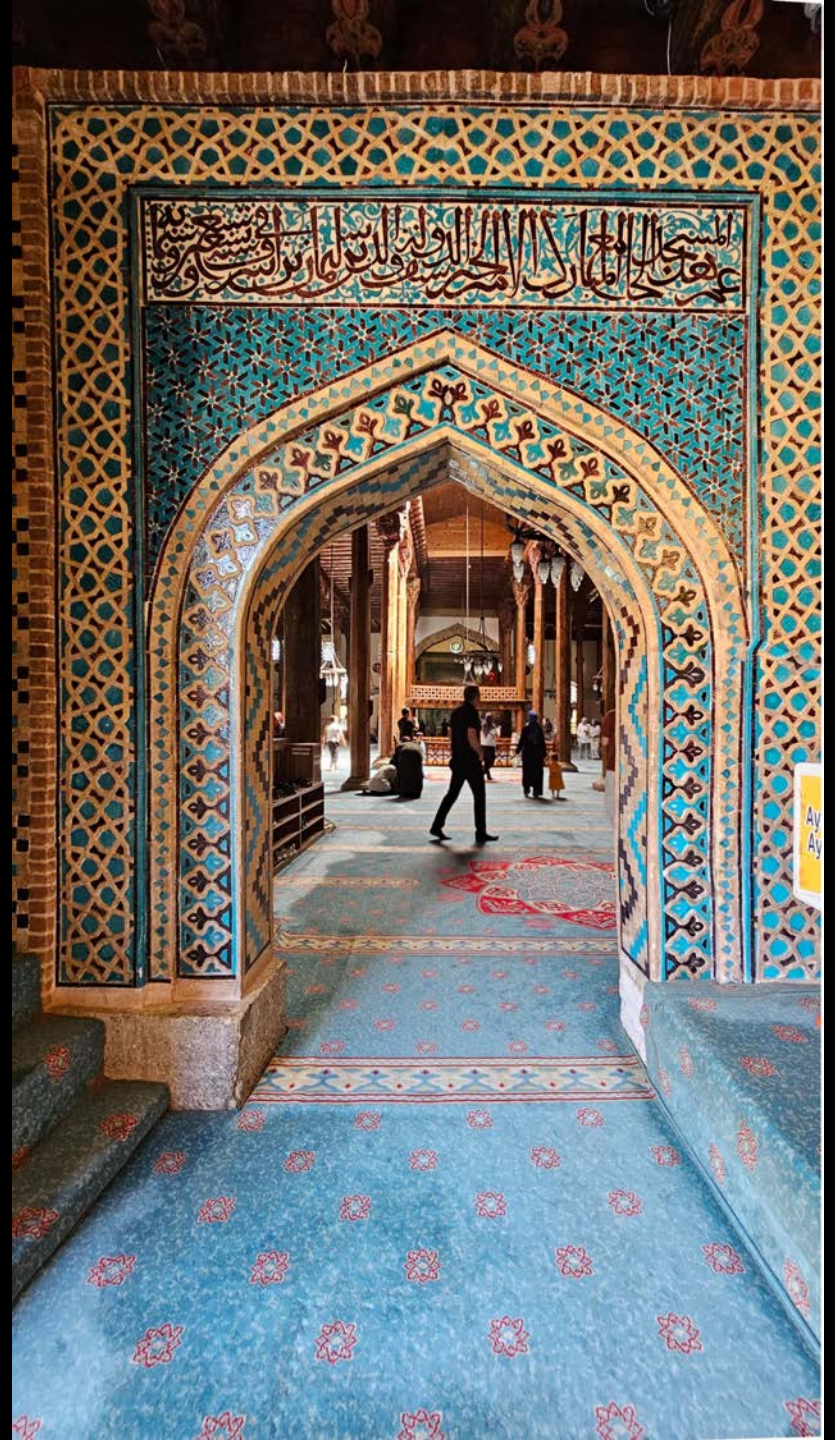
Şah Nematollah Vali Mabedi, Mahan, İran, 1431. Mavi girih çinili kubbe, üstten sırayla 5, 7, 9, 12, 11, 9 ve 10 puanlı yıldızlar içerir. İslam sanatında 11 noktalı yıldızlar nadirdir

Girih, Shah-i-Zinda, Semerkant, Özbekistan

Shah-i Zinda, Semerkant, Özbekistan



Shah-i Zinda, Semerkant, Özbekistan



Esrefoglu Camii - 1296

Esrefoglu Camii - 1296

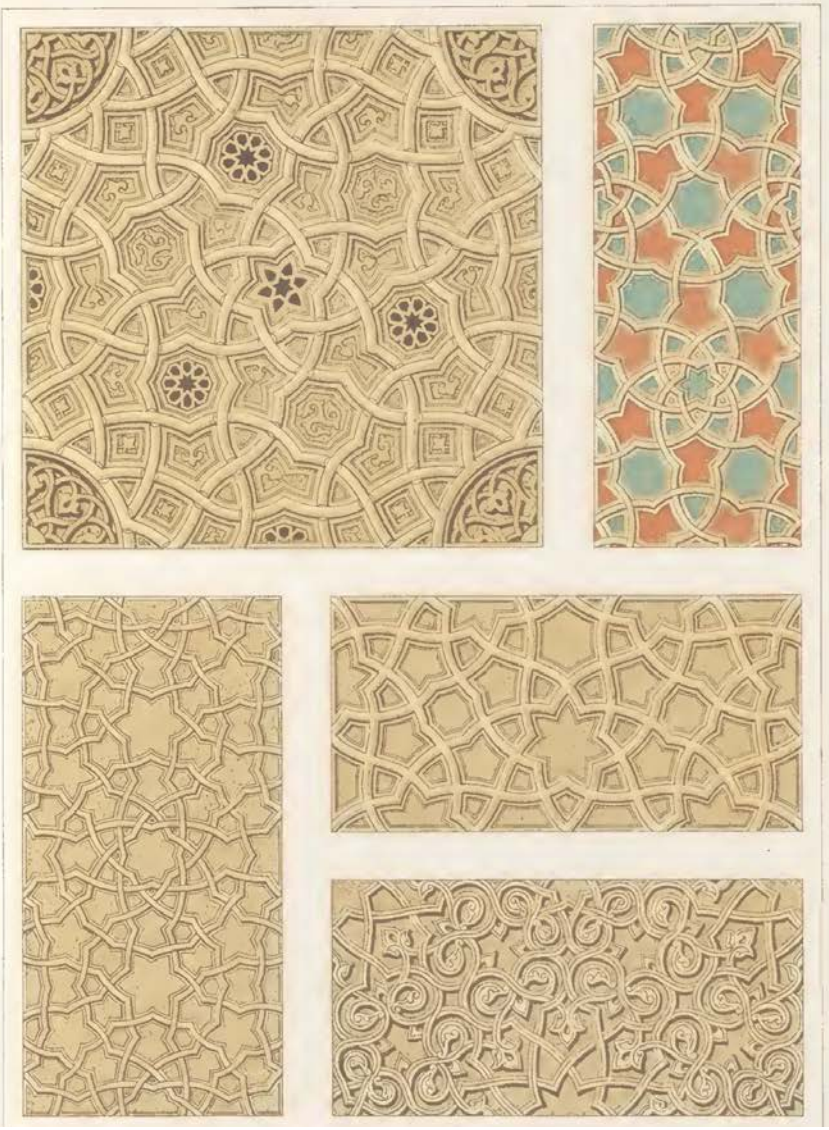
Fatih Camii

Ana Hatlarıyla Türk İslam Sanatları ve Estetiği

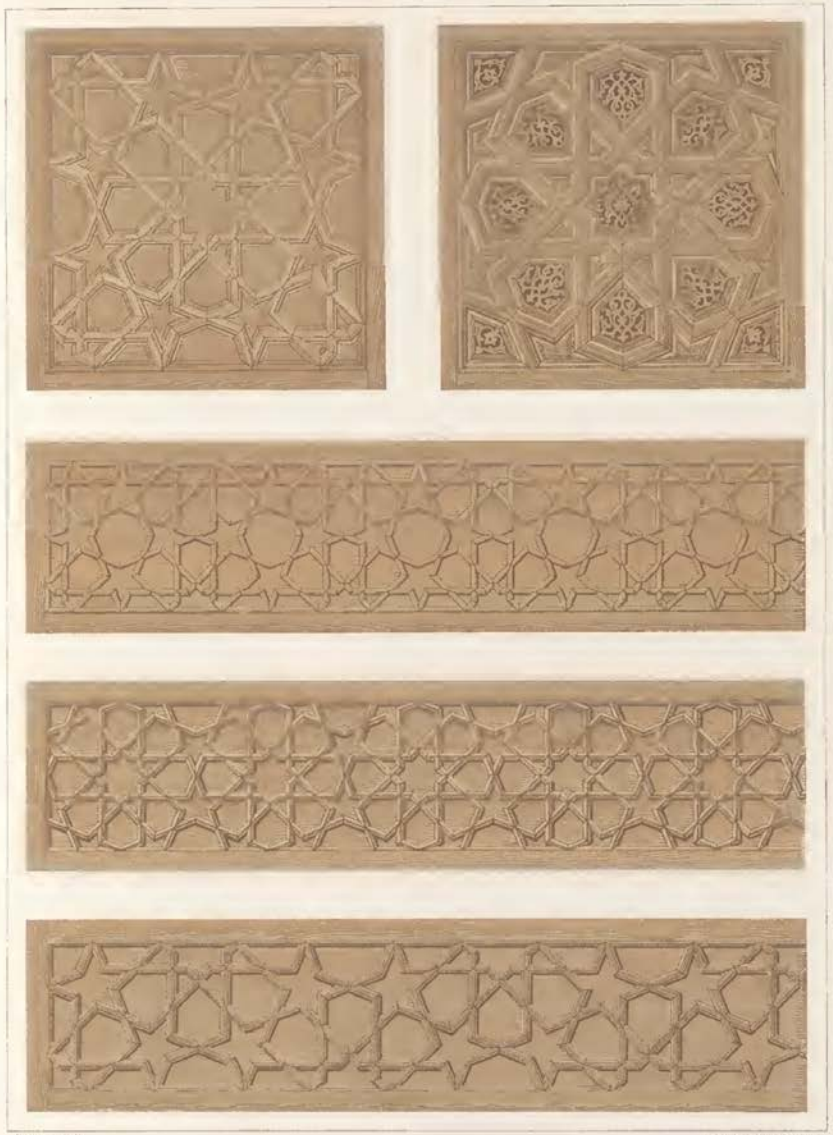
Yılmaz Can, Recep Gün

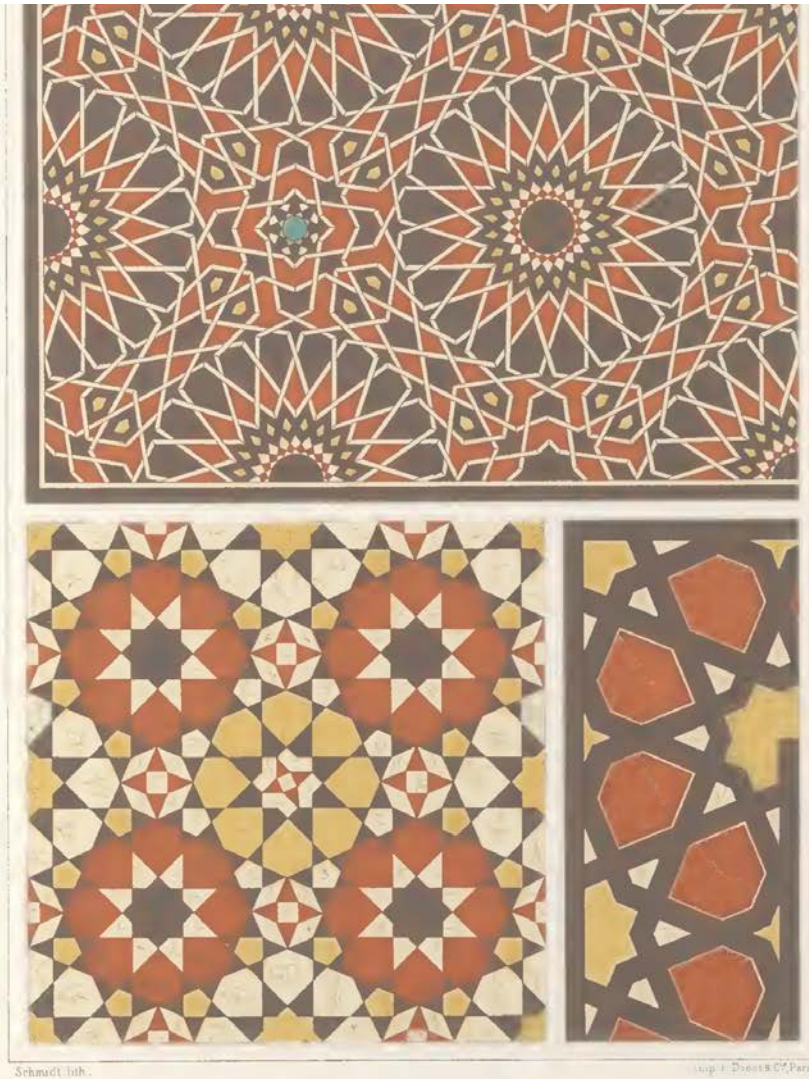
İslam sanatında belirginleşen sonsuzluk fikri ve somuttan soyuta kaçış anlayışı, esas itibariyle İslam'ın varlık telakkisiyle ilgilidir. İslam düşünürleri tüm varlık aleminin, Yaratıcının bir tecellisinden ibaret olduğunu ve her varlığın arkasında Yaratıcı'nın bulunduğunu belirtirler. Onlara göre her şey geçicidir; ezeli ve ebedi olarak yegane kalıcı varlık Allah'tır. İşte İslam tezniyatında bu gerçekler hatırlatılmakta ve Yaratıcının sonsuz gücüne, kudretine karşılık insanın acizine işaret edilmektedir.

PL. III.



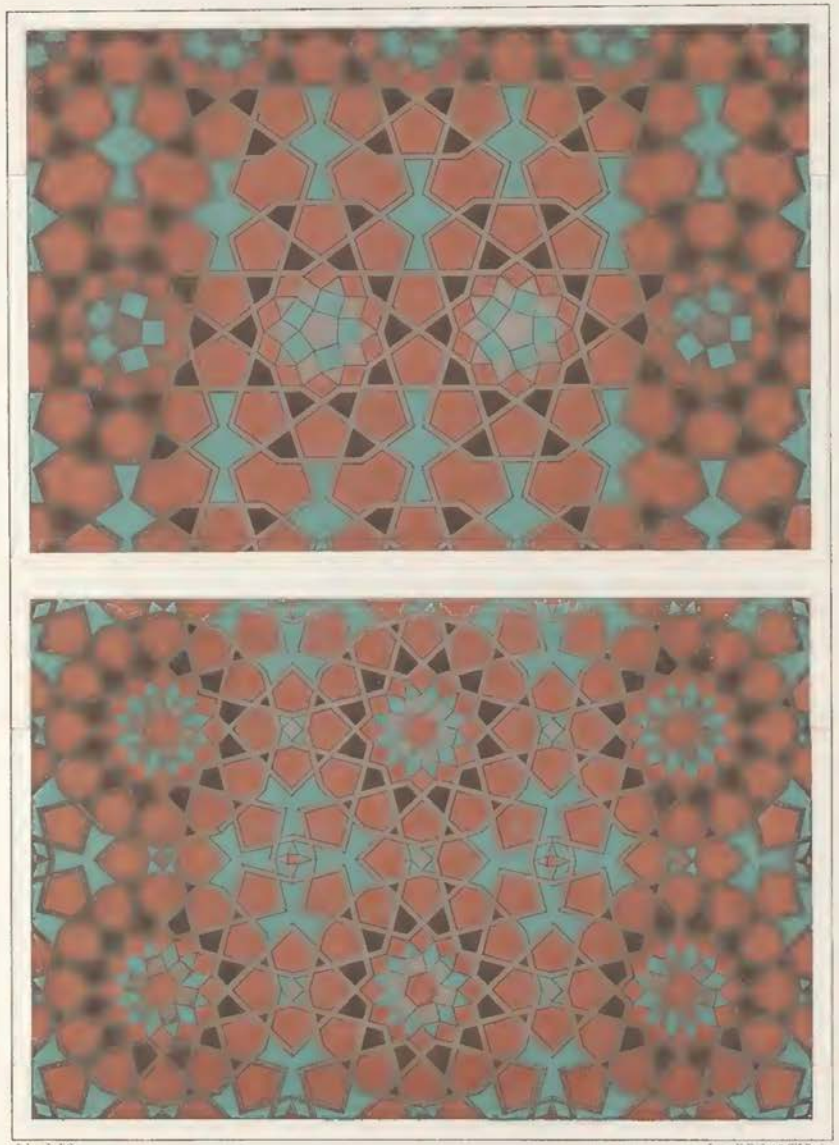
PL. II





Schmidt lith. Imp. F. Didot & Cie, Paris.

MOSAÏQUES

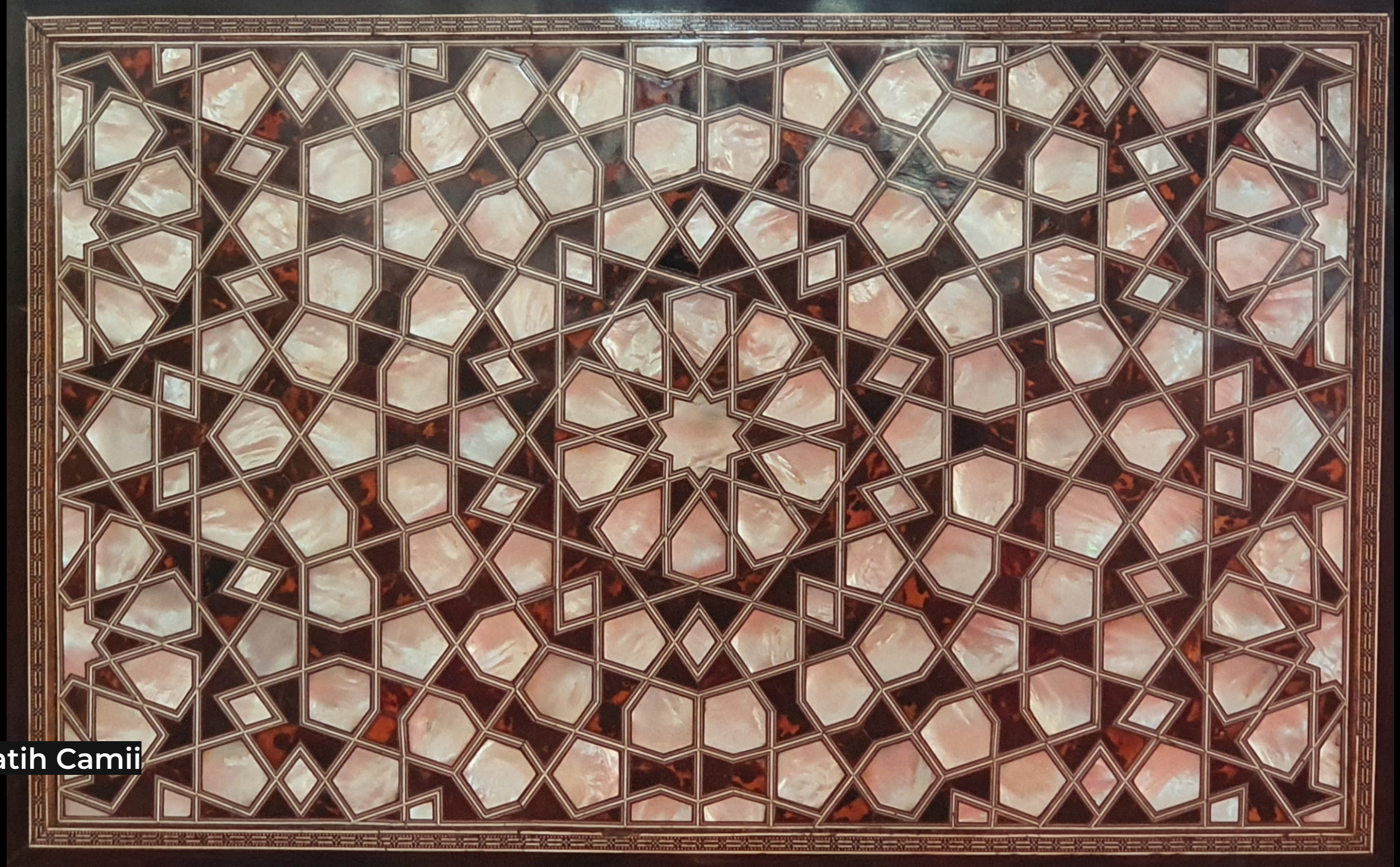


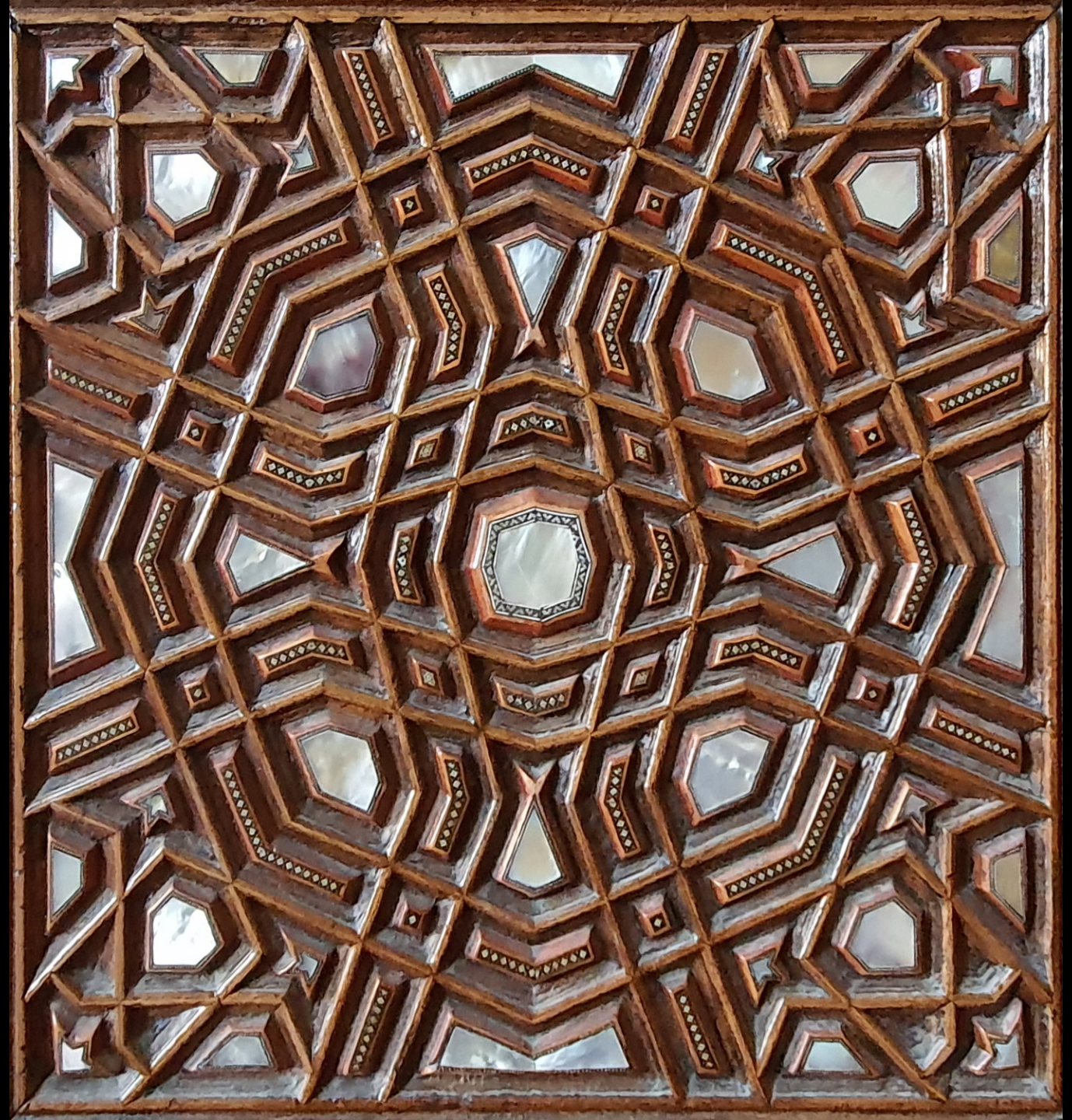
Schmidt lith. Imp. F. Didot & Cie, Paris.

Schmidt. lith. Imp. F. Didot & Cie. Paris

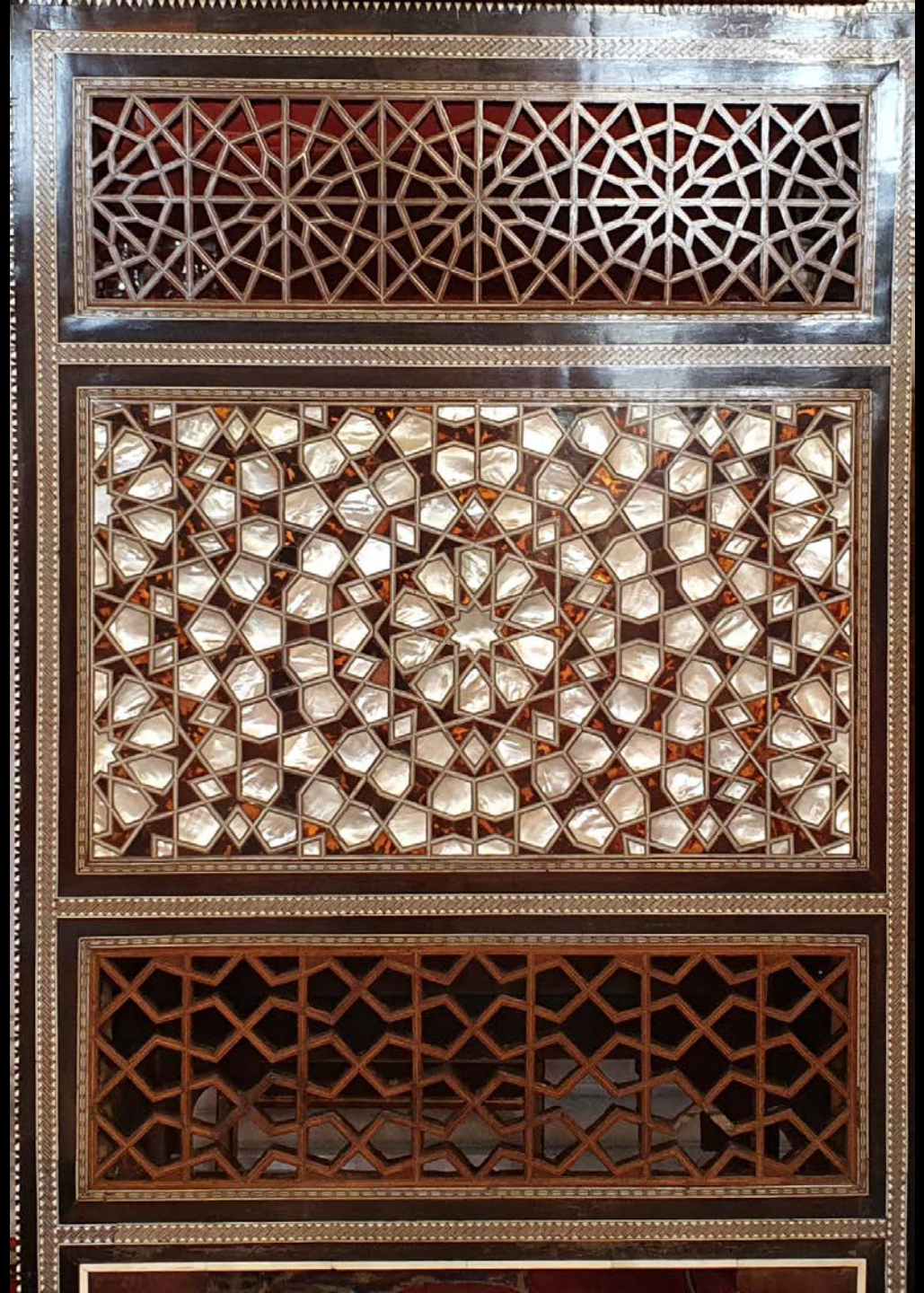
INCRUSTATIONS

Schmidt. lith. Imp. F. Didot & Cie. Paris

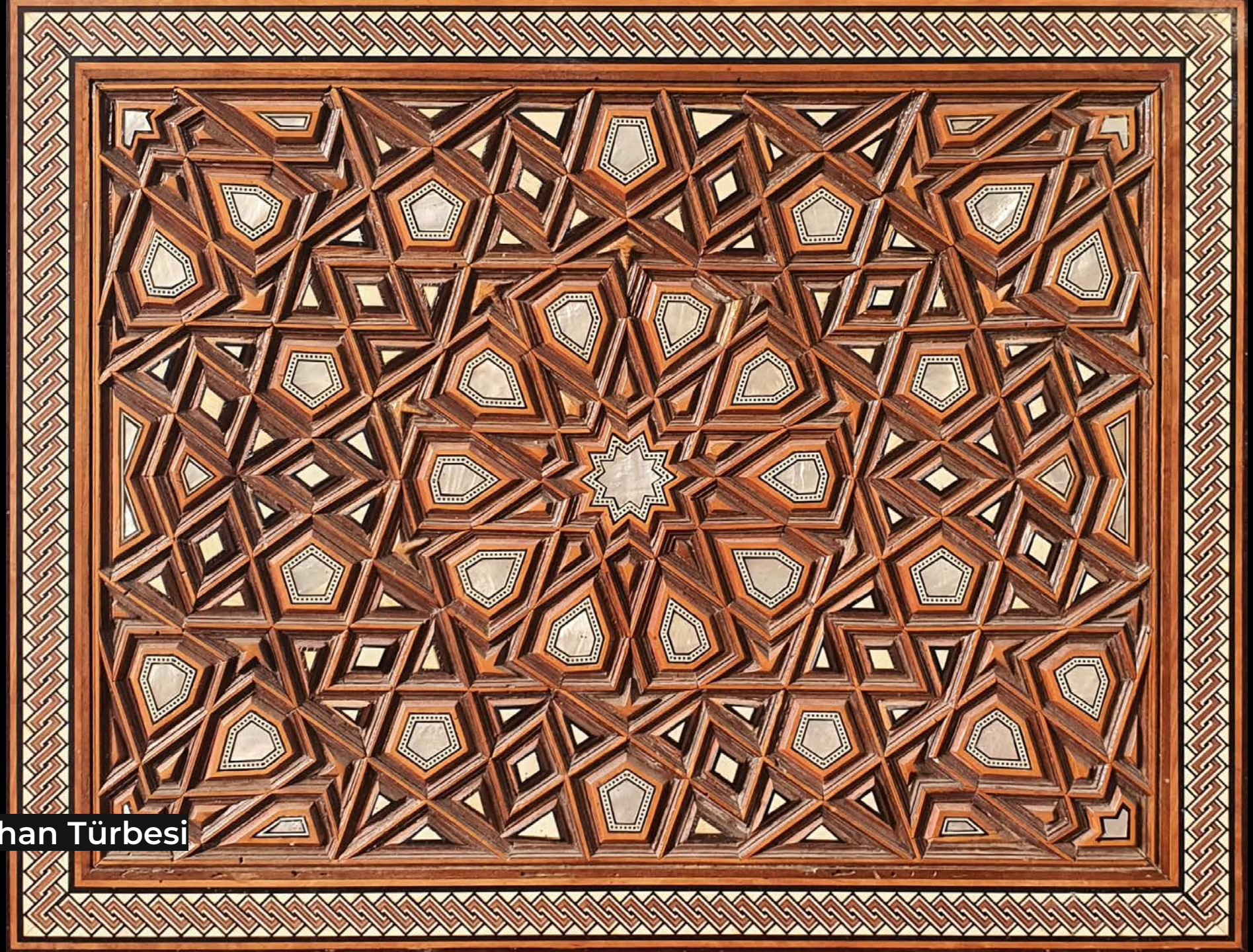

Fatih Camii



Fatih Camii

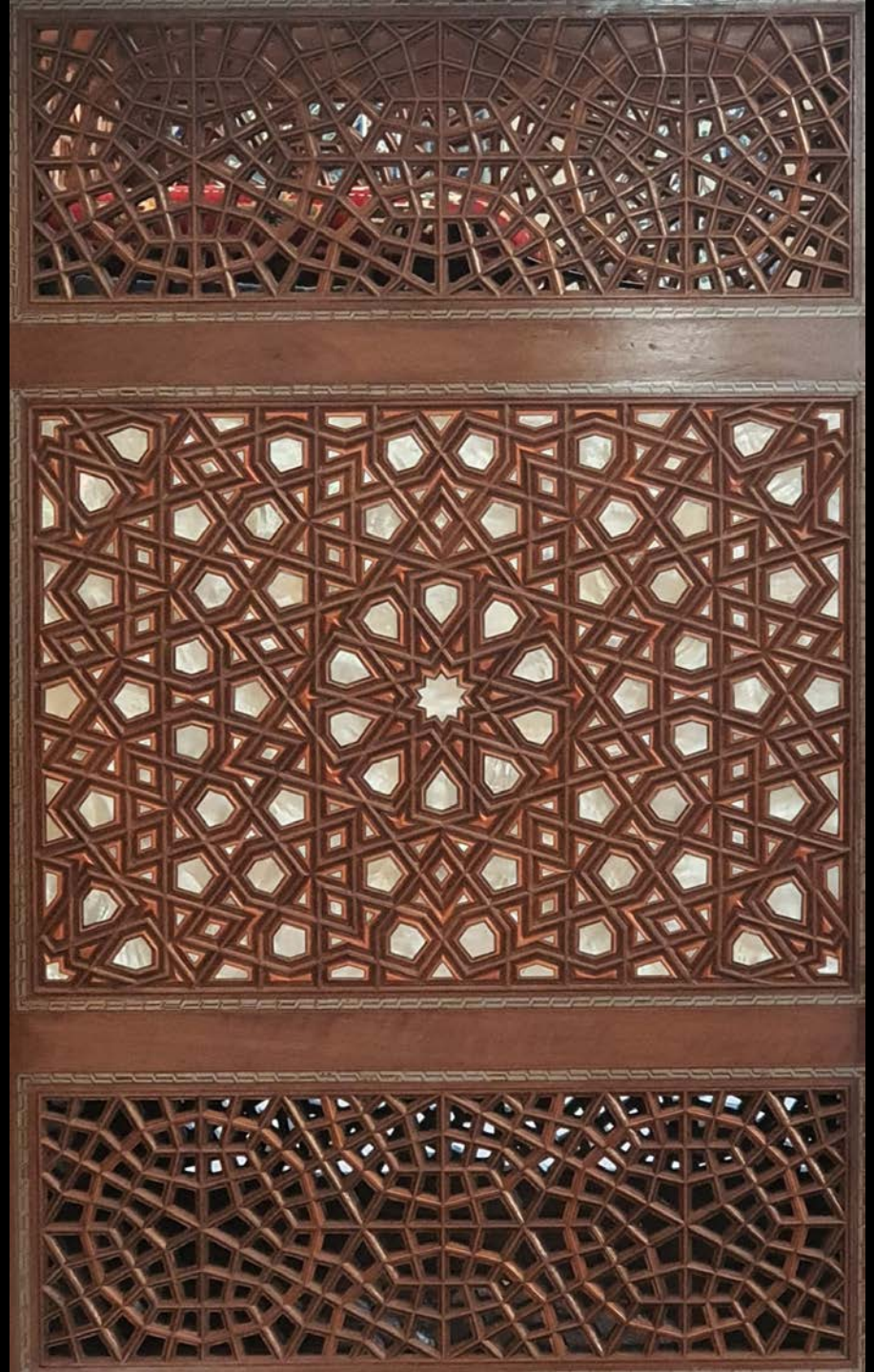


Fatih Camii



Hatice Turhan Türbesi

Rüstem Paşa Camii



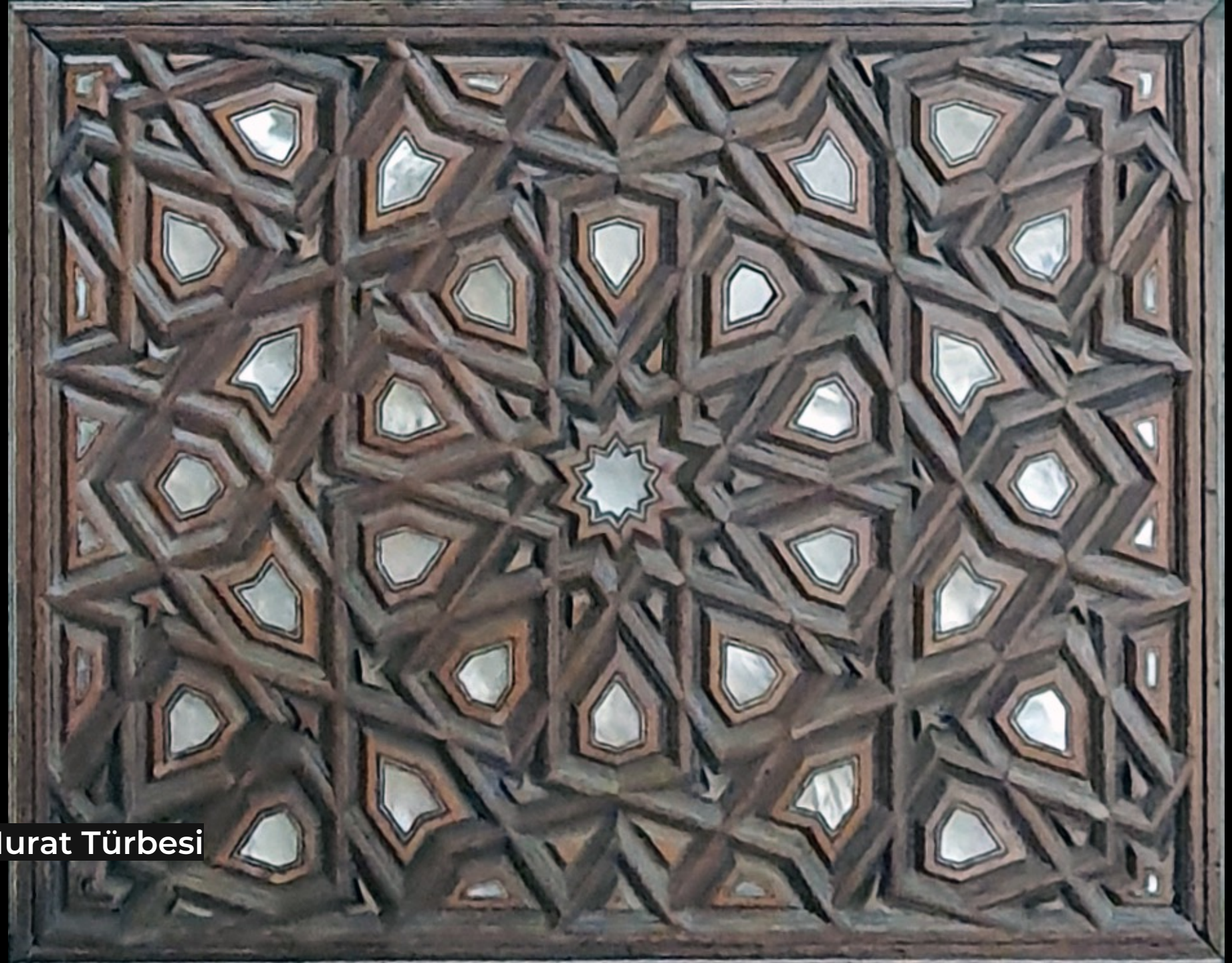
Rüstem Paşa Camii


Şehzade Camii

Süleymaniye Camii

Süleymaniye Camii

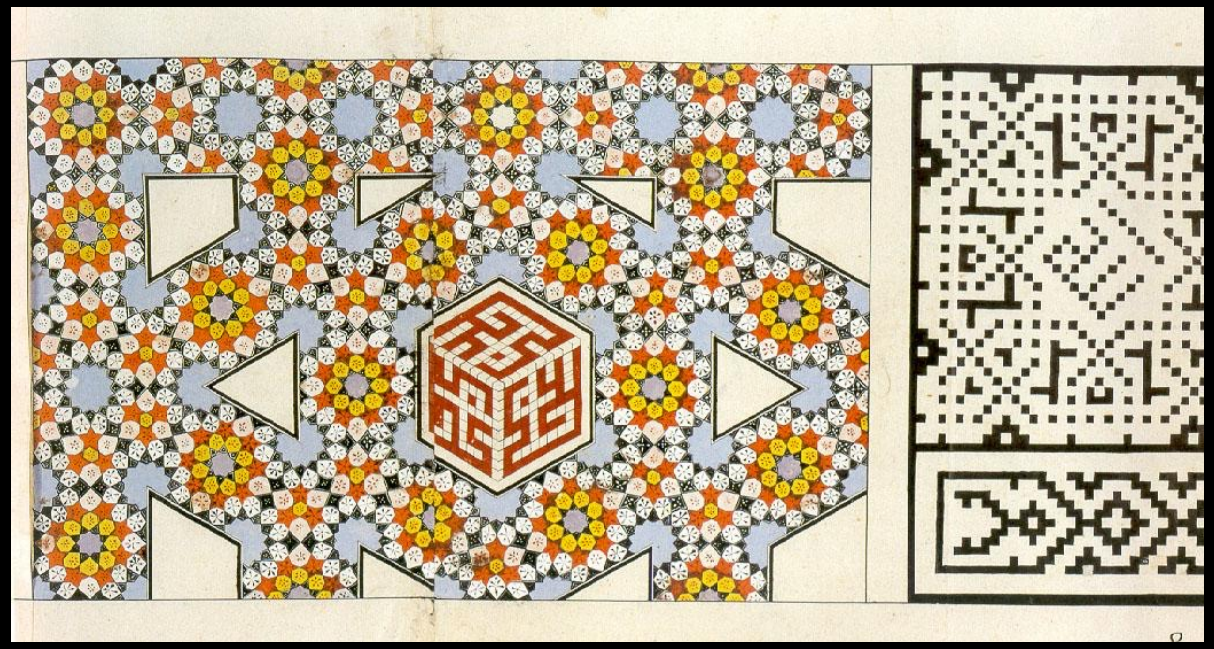
Sultan II.Selim Türbesi

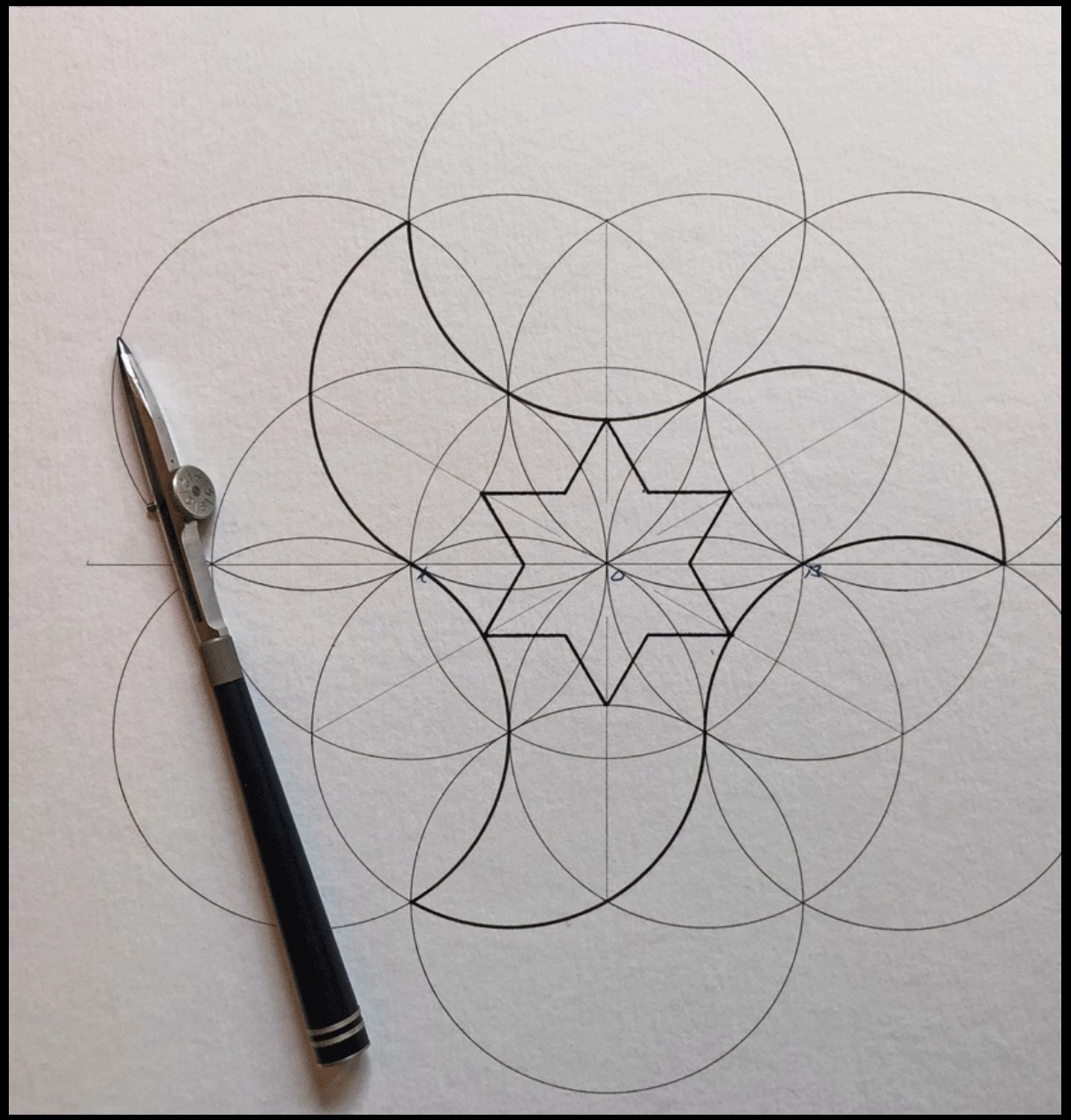


Sultan IV. Murat Türbesi

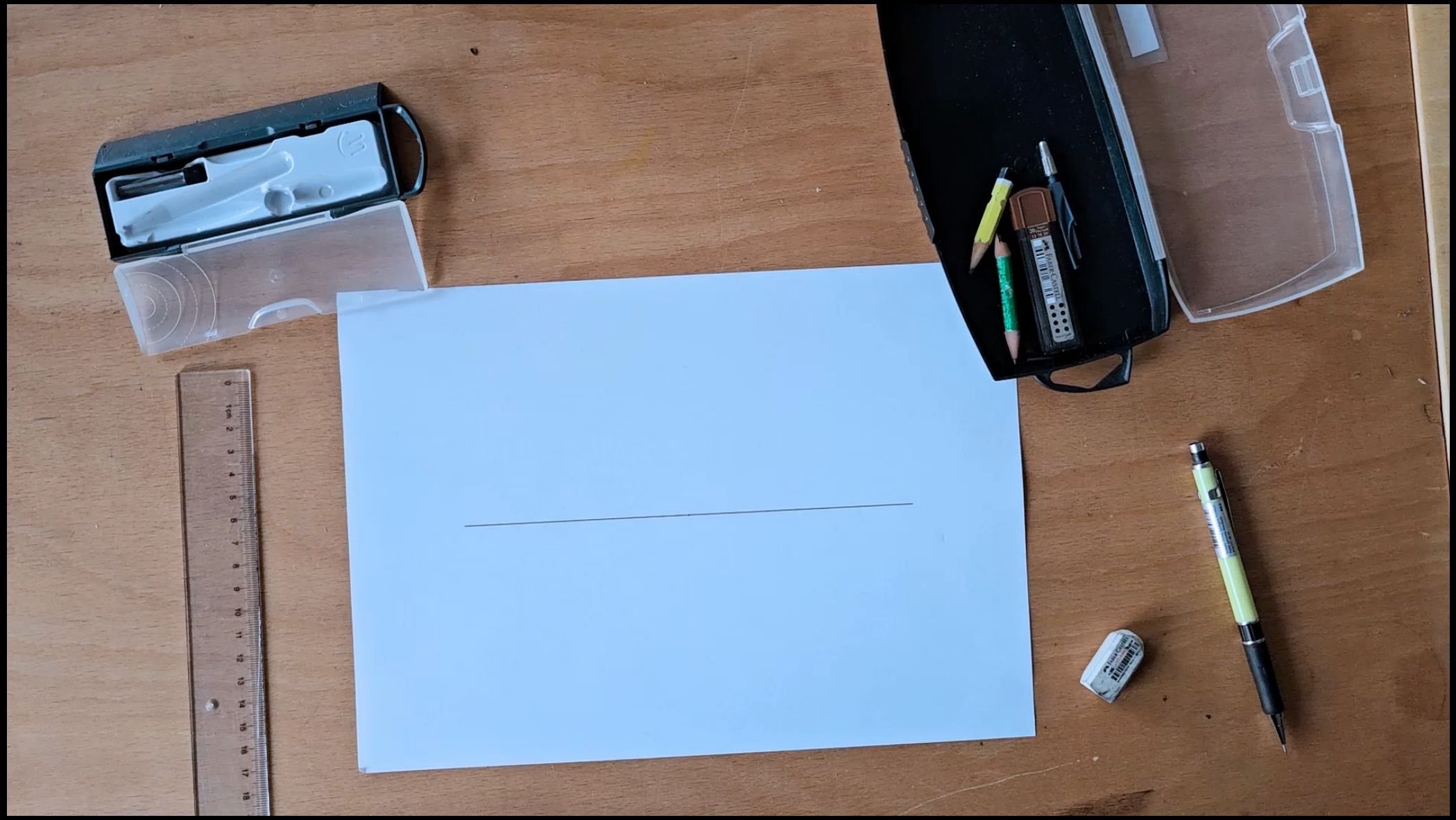
İşin içinde gerçekten de Matematik var mı?

Geleneksel Metodlar

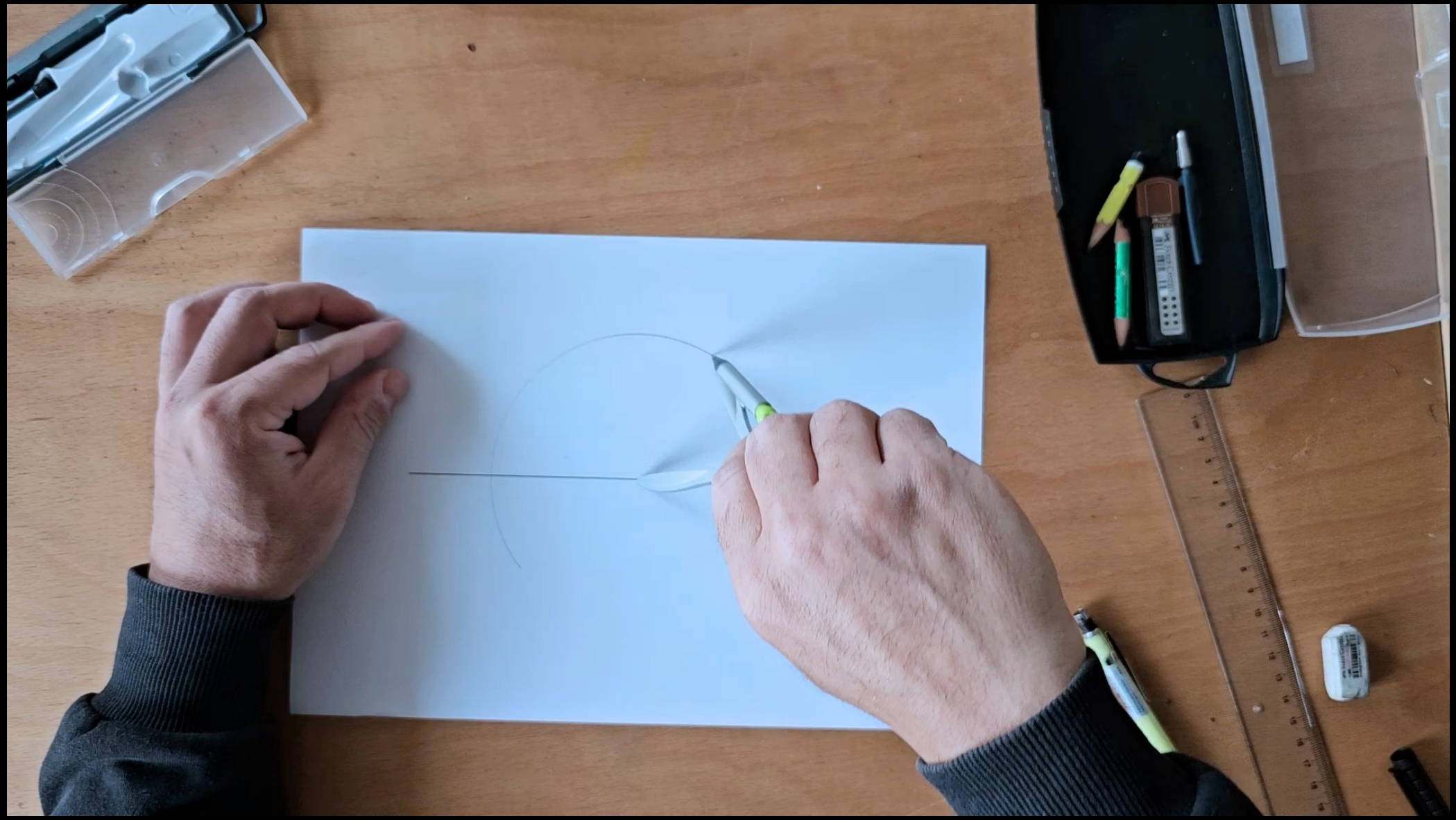





PAT. NO. 1526566 & 2118106
pergel
açıölçer
Noris Club HB
cetvel
May the Force be with you....



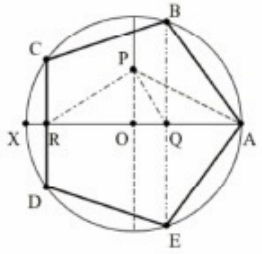
İki ve katları



Altıya Bölme

Construction of Regular Pentagon by H. W. Richmond

As Ptolemy's *construction described by S. Brodie*, the one below seeks to construct a regular pentagon inscribed in a given circle. The latter is dated 1893 and attributed to H. W. Richmond. The approach has been expanded by [*Conway and Guy*] to the construction of other regular polygons.



Let XA be a diameter of the circle with center O.

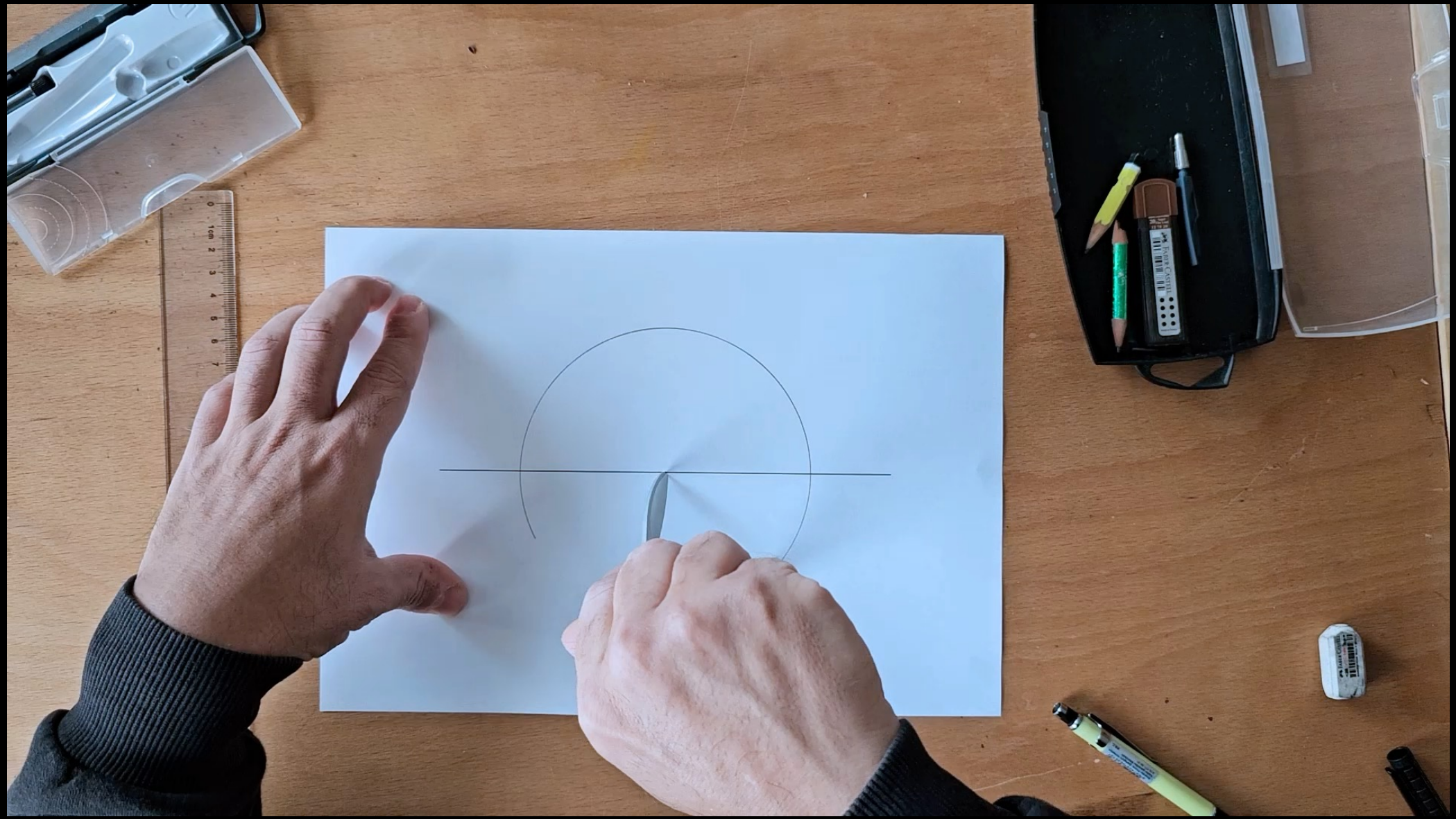
1. Choose P midway on the radius perpendicular to XA.
2. Draw a bisector of ∠APO to the intersection Q with XA,
3. and an external bisector to the intersection with XA at R.
4. If A is taken to be one of the vertices of the regular pentagon, Q and R are the projections of the other four onto XA. These can be obtained by erecting perpendiculars to XA at Q and R.

Proof

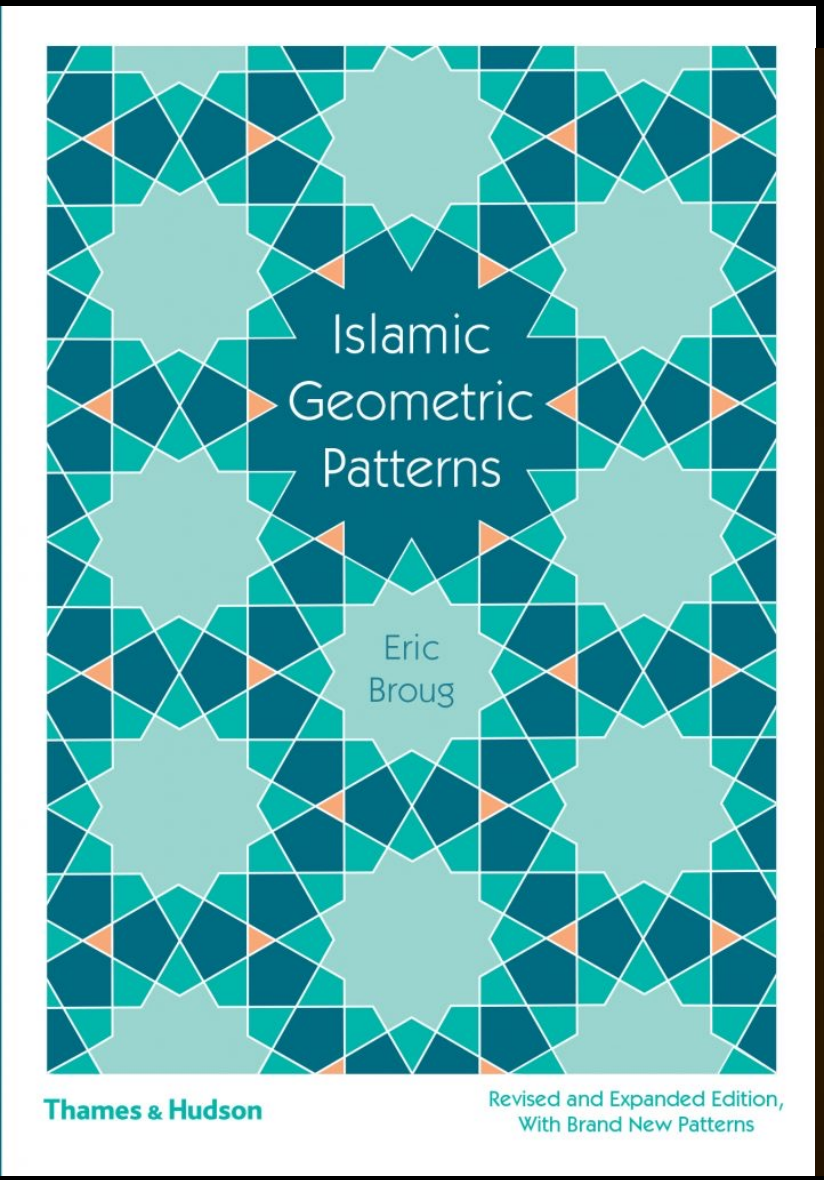
Assume the radius of the circle is 1. Then OP = 1/2. From the *Pythagorean theorem*, AP = $\sqrt{5}/2$. By a *property of angle bisectors*,

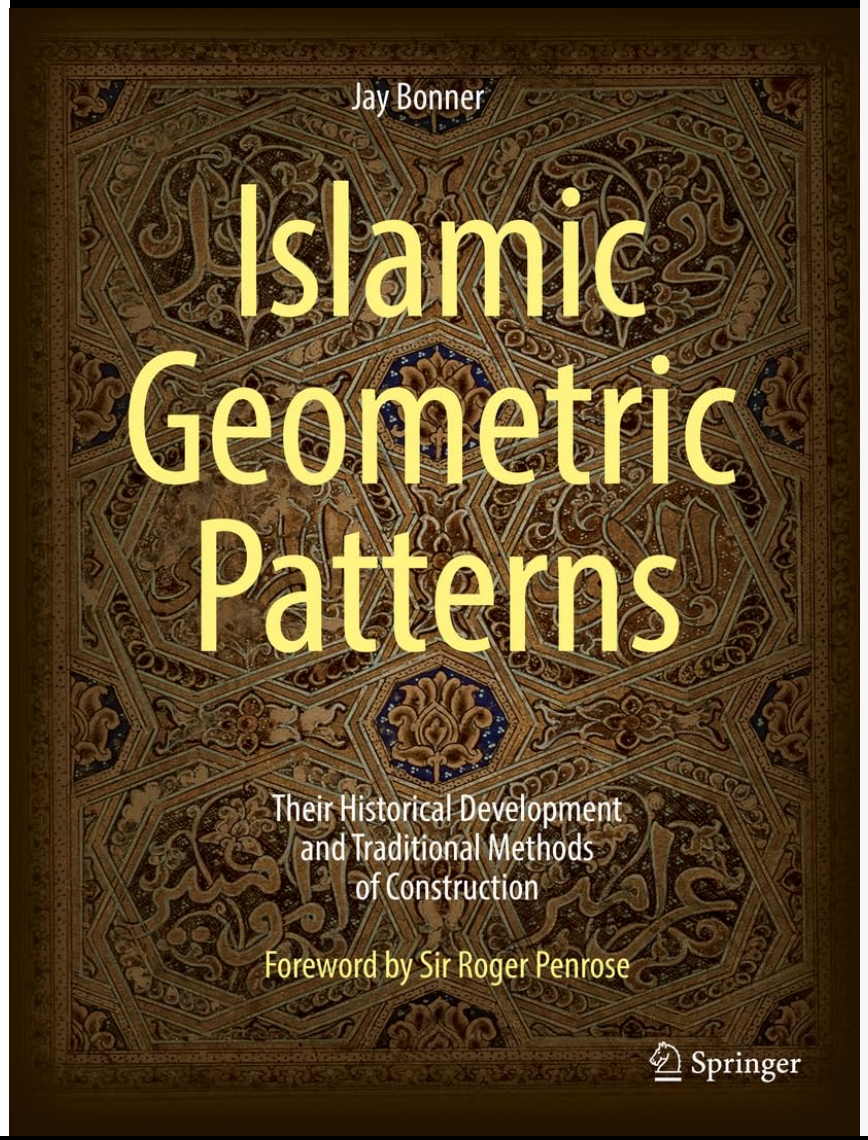
$$OQ / AQ = OP / AP = 1/2 : \sqrt{5}/2.$$

Since OQ + AQ = 1, we find OQ = $(\sqrt{5} - 1) / 4$. But the latter is the *value of cos(72°)*, which allows us to conclude (from ΔOBQ) that ∠BOQ = 72°, such that A and B are indeed successive vertices of a regular pentagon.



Beşe bölme


Islamic
Geometric
Patterns
Eric
Broug
Thames & Hudson
Revised and Expanded Edition,
With Brand New Patterns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Their Historical Development
and Traditional Methods
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Foreword by Sir Roger Penrose
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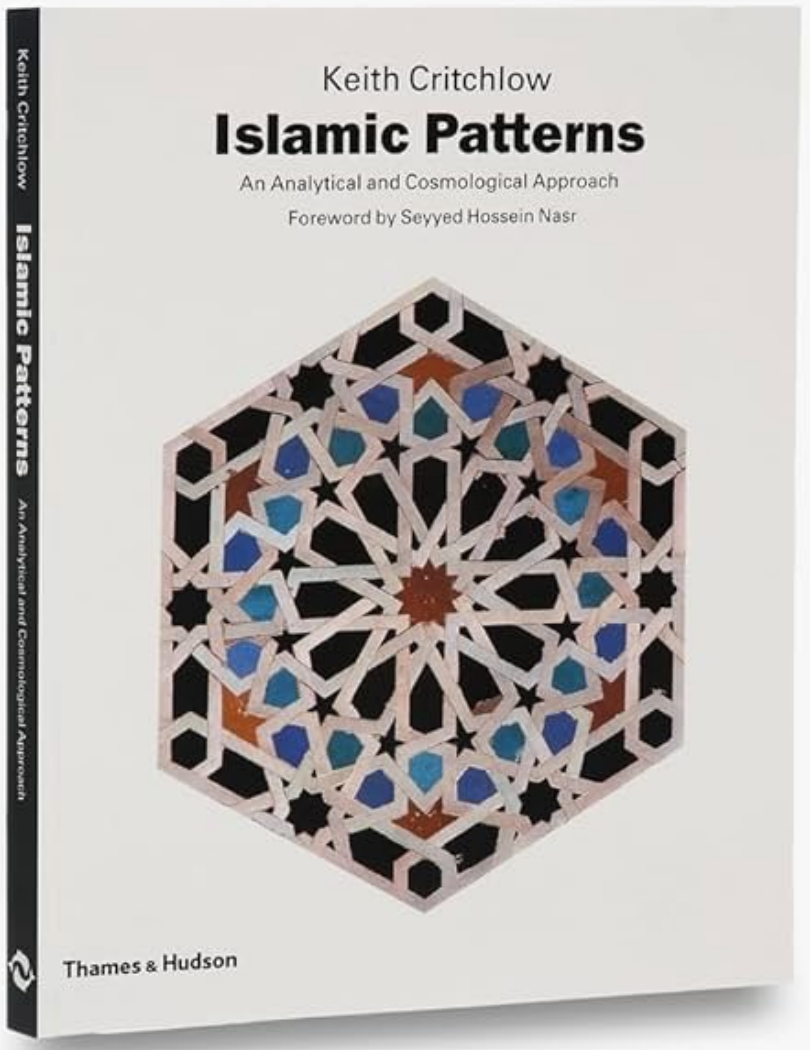
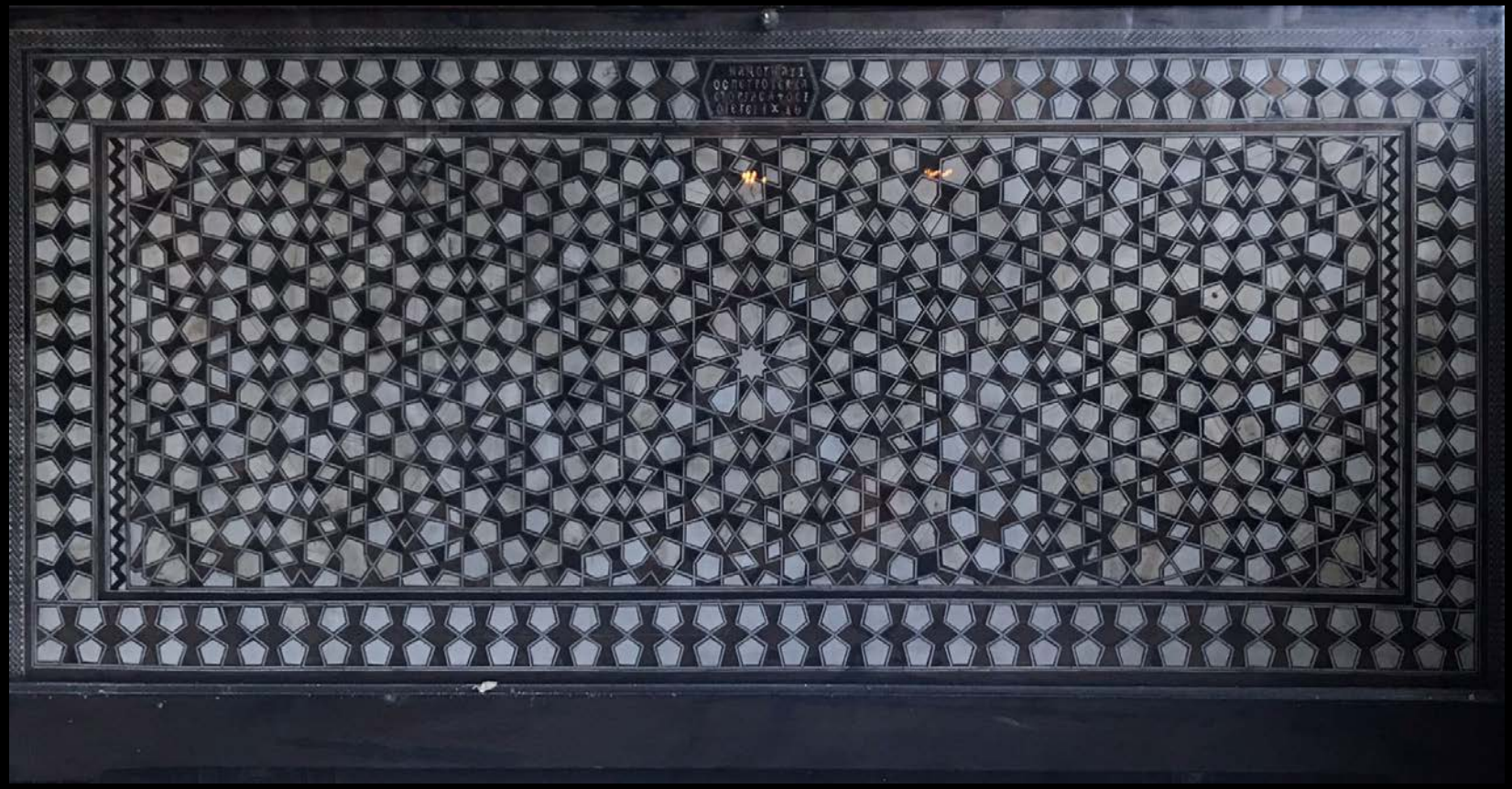
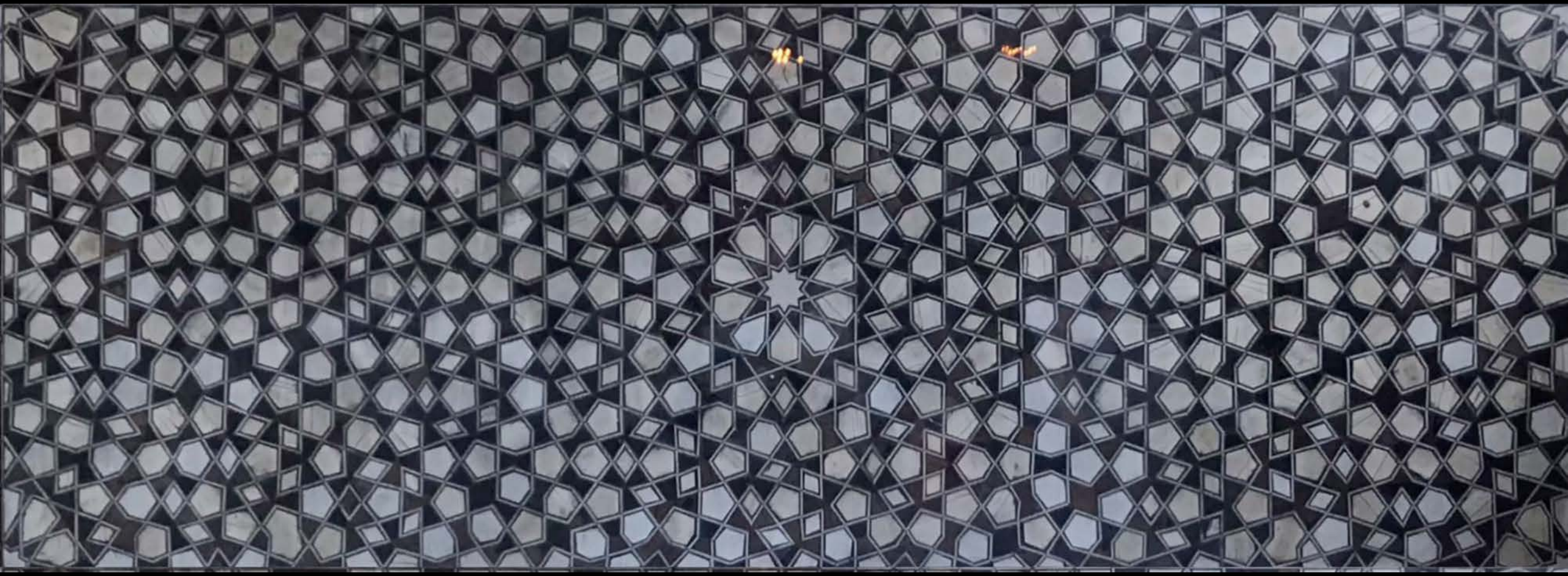

Keith Critchlow
Islamic Patterns
An Analytical and Cosmological Approach
Foreword by Seyyed Hossein Nasr
Thames & Hudson


İSLÂM MİMARİSİNDE
HENDESÎ DESENLER
Topkapı Tomarı ve İslâm Mimarisinde
Geometrik Desenlere Küllî Bakış
Serap Ekizler Sönmez
İSLÂM MİMARİSİNDE
HENDESÎ DESENLER
-I-
İSLÂM MİMARİSİNDE
HENDESÎ DESENLER
-II-

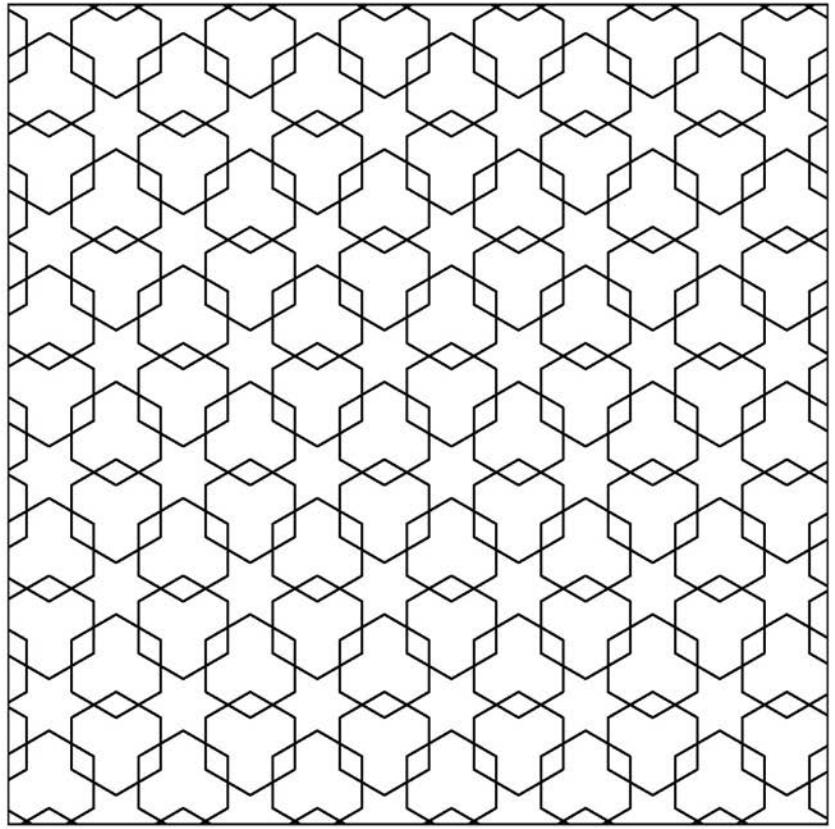


Rum Patrikhanesi, İstanbul



Geometrik Desen Üretme İş Akışı #1

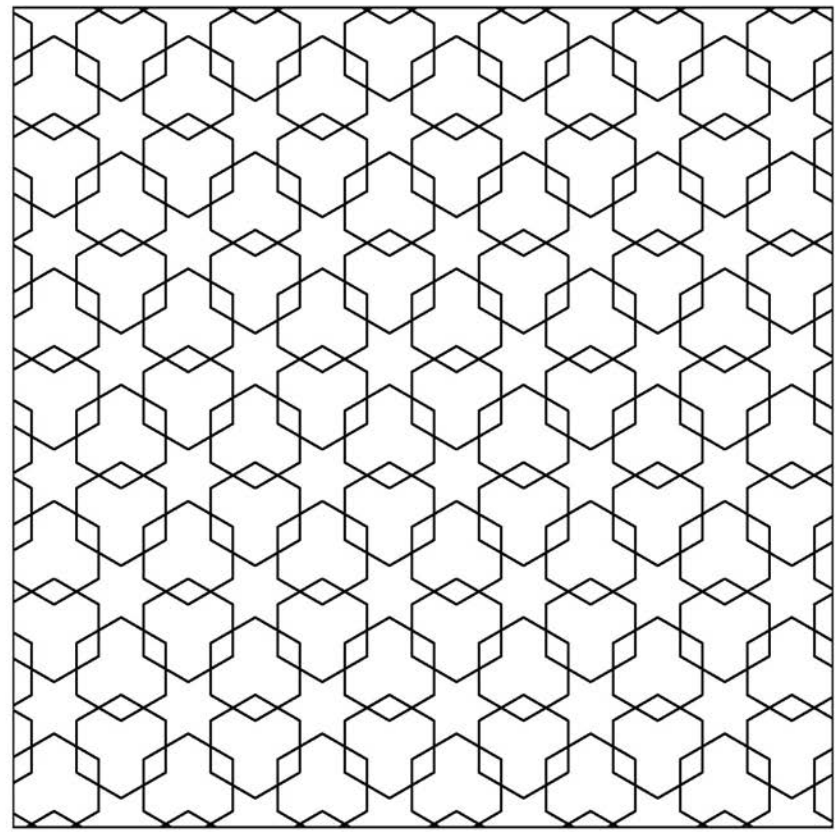
Geometrik deseni inceleyin ve yapıtaşlarını analiz etmeye çalışın



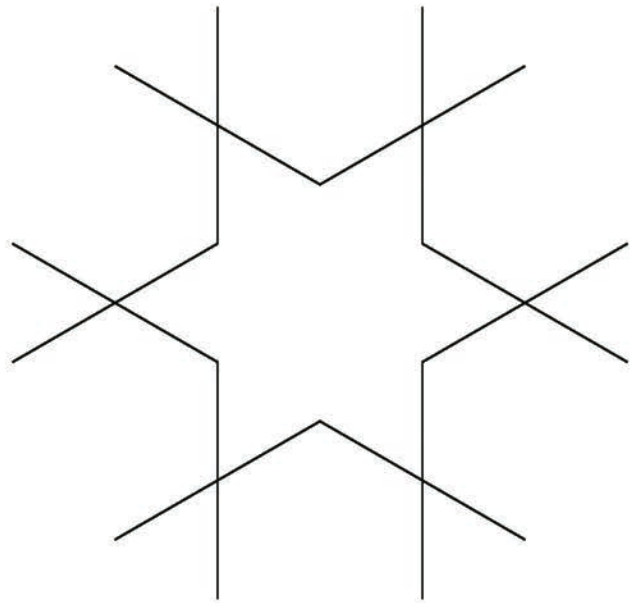
Örnek: İslam Geometri Sanatı / Mevlana Müzesi, Konya

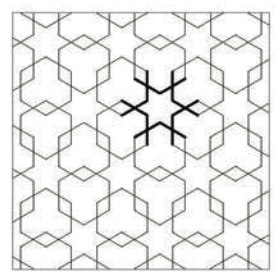
Geometrik Desen Üretme İş Akışı #1

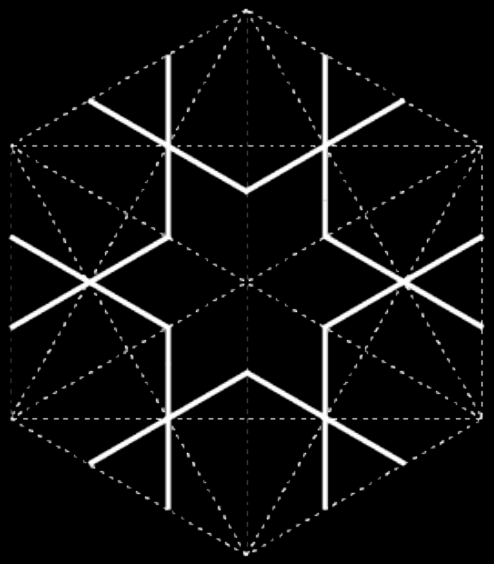
Geometrik deseni inceleyin ve yapıtaşlarını analiz etmeye çalışın



Motif

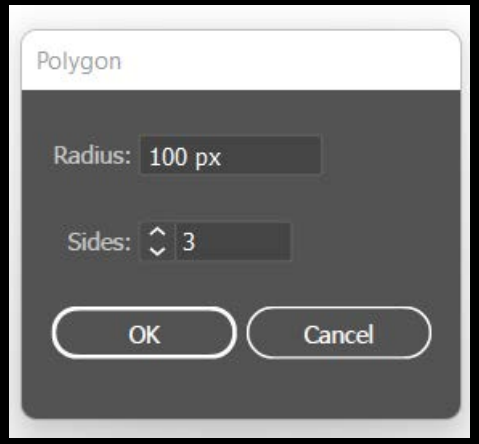


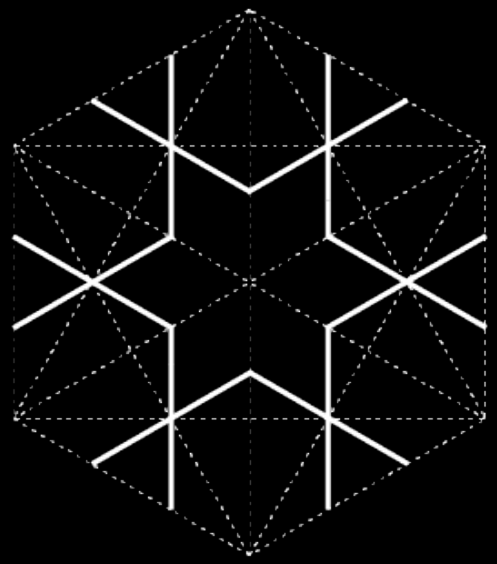




Illustrator İş Akışı

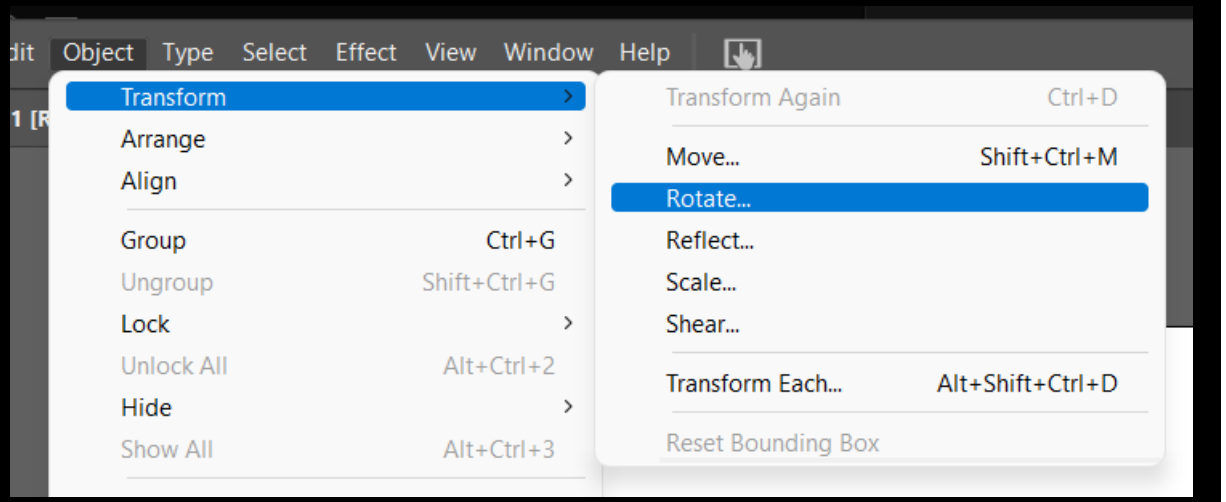
1-Artboard yaratın
2-Polygon kullarak için boş üçgen yaratın

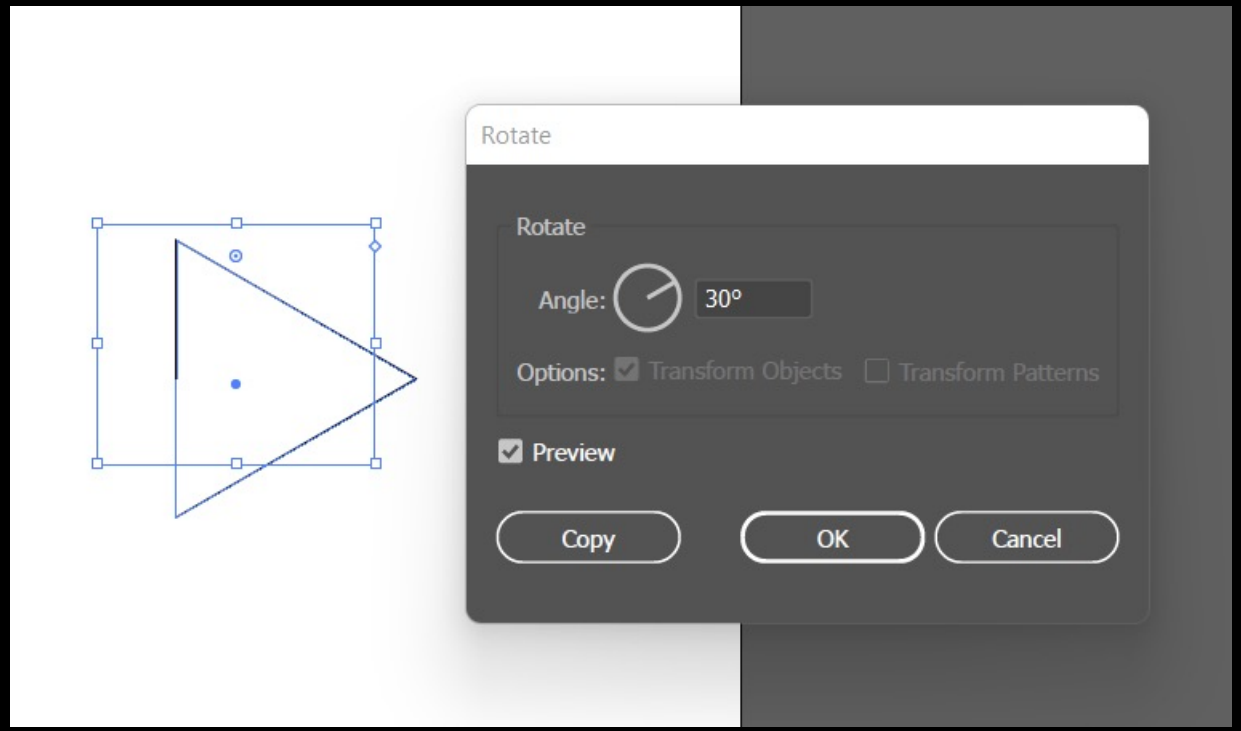


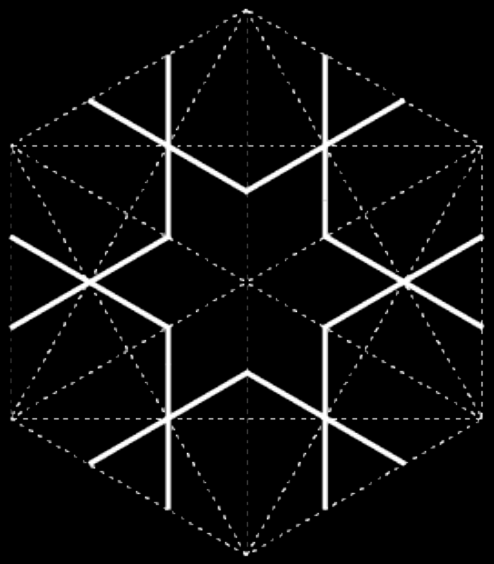


Illustrator İş Akışı

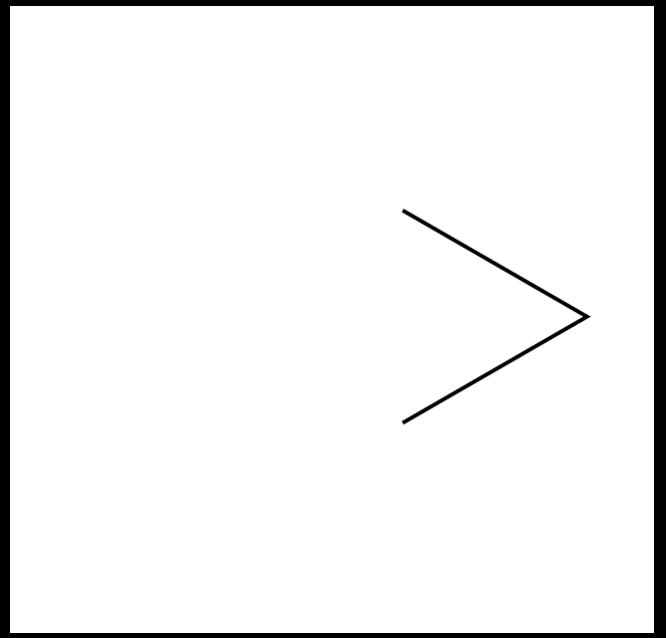
3-Object > Transform > Rotate (30 derece)

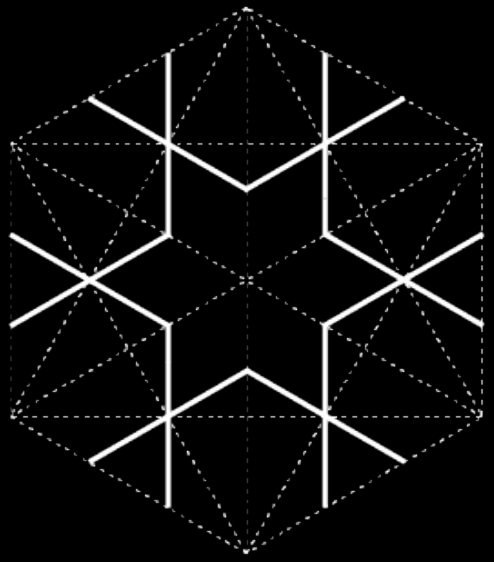






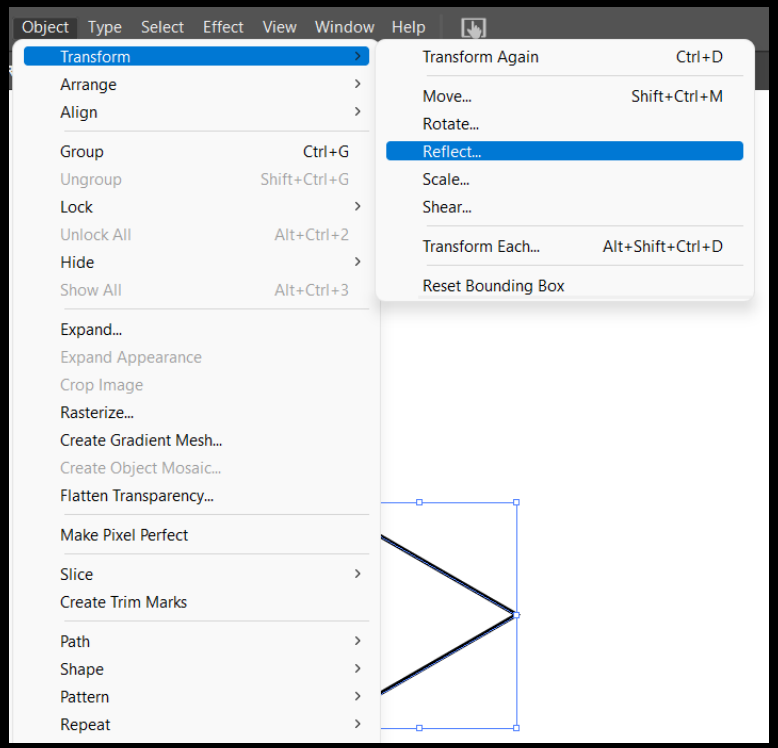
4-Üçgenin sol tarafını silmek için direct selection aracını kullanın.

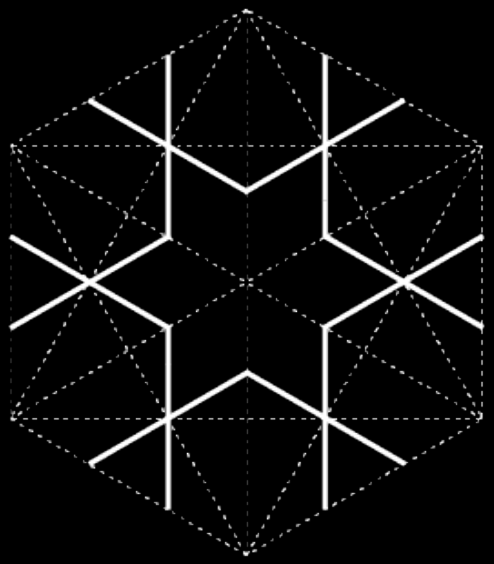




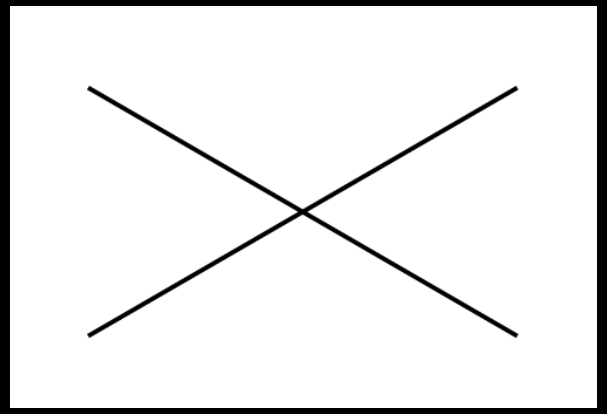
Illustrator İş Akışı

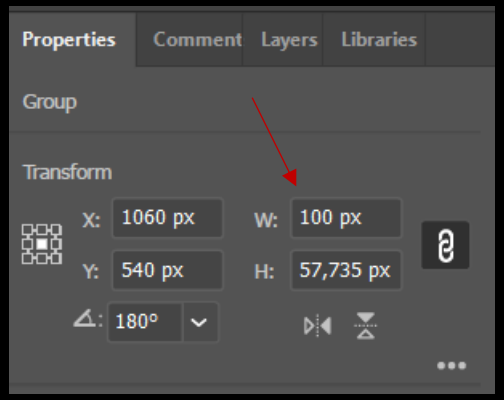
5-Object > Transform > Reflect (Vertical Copy Opsiyonu)

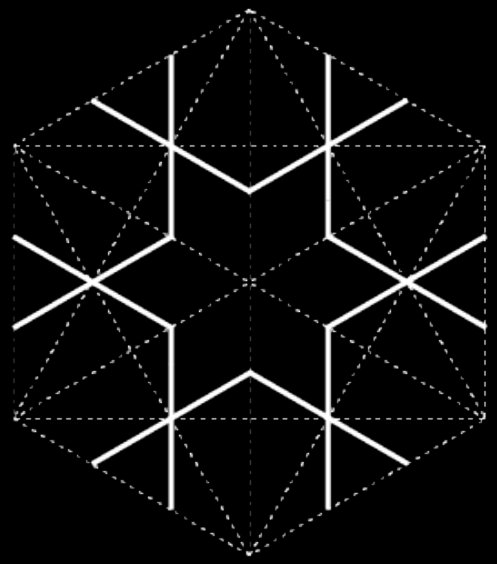




6- Yansıyan kopyayı sağa taşıyın ve ok uçlarını gruplayın (Ctrl+G) ve 100 piksel genişliğinde yapı taşımızı elde ederiz.

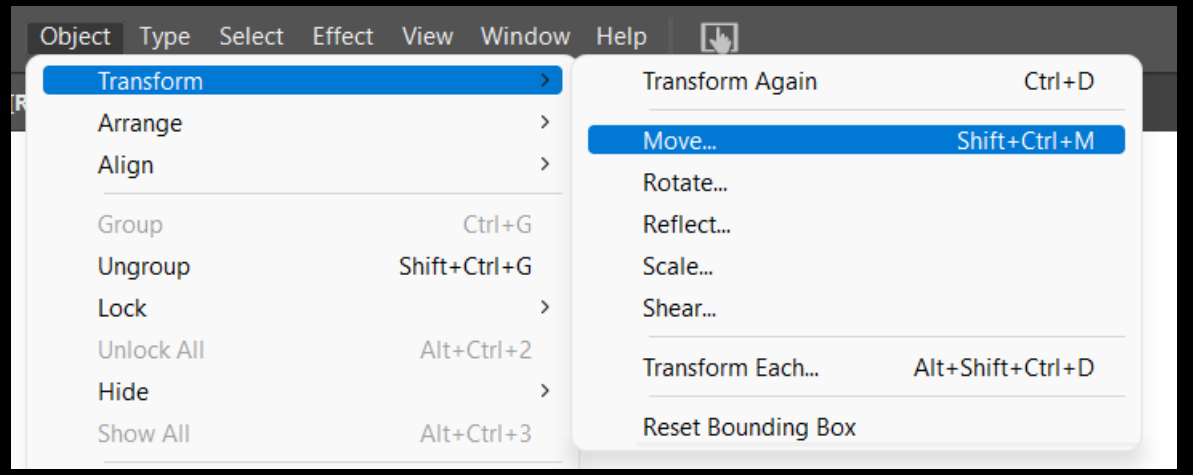


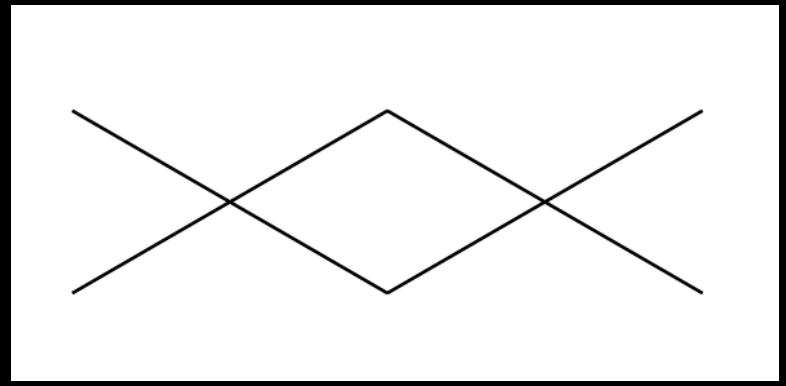


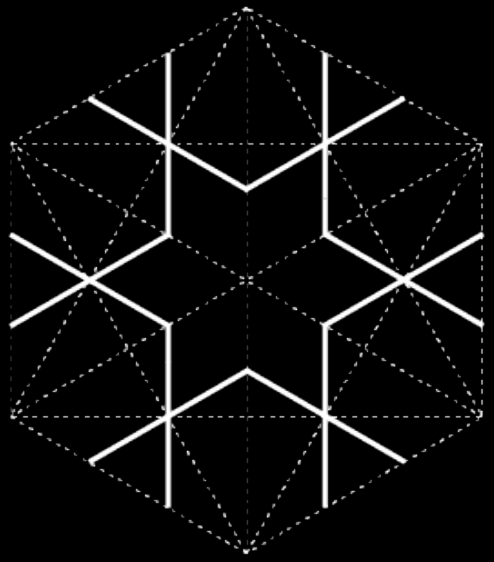


Illustrator İş Akışı

7- Object > Transform > Grup şeklini kopyala seçeneği ile 100 piksel sağa hareket ettirin

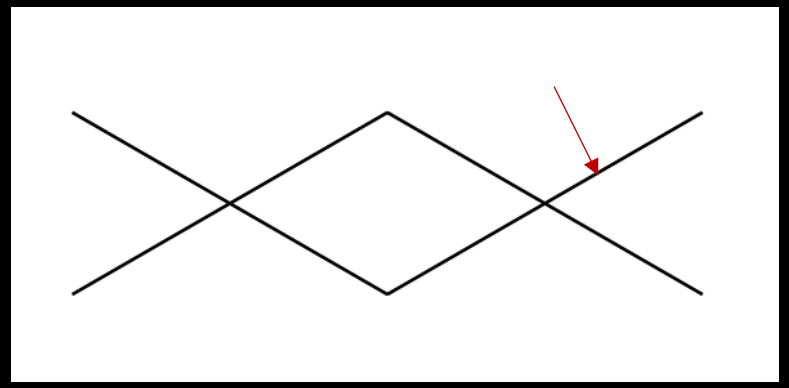


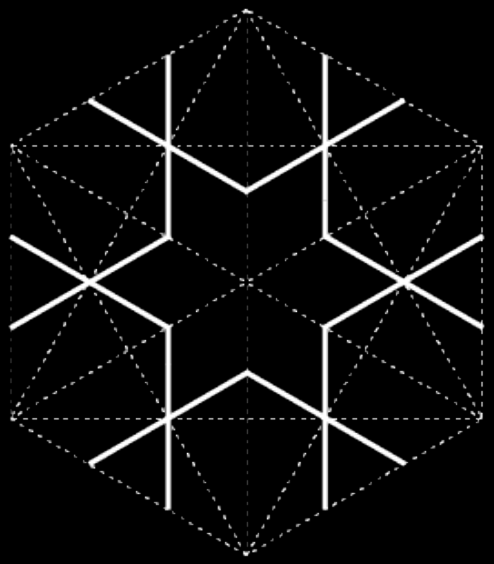




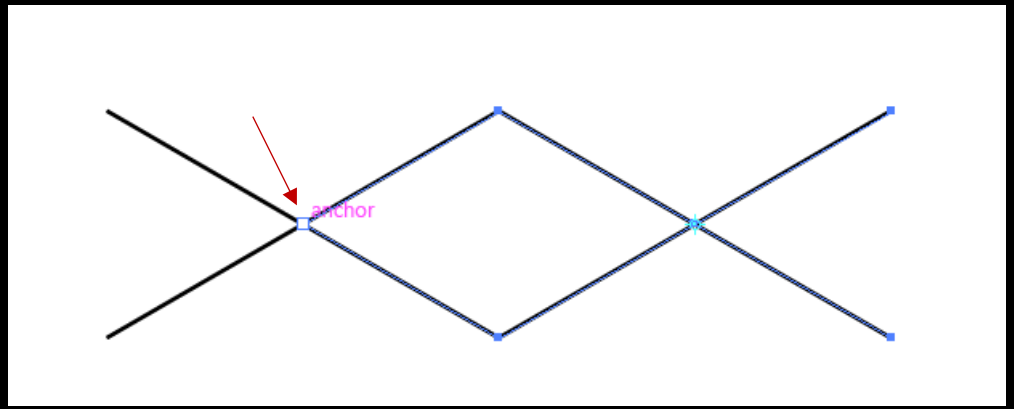
Illustrator İş Akışı

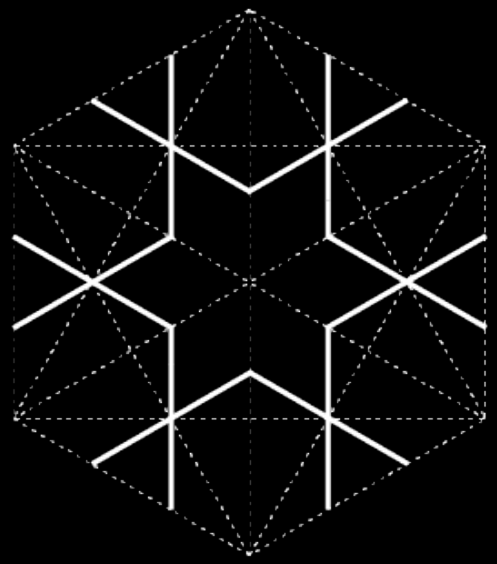
8- En sağdaki grubu seçin ve döndürme aracını kullanmak için klavyenizde r tuşuna basın





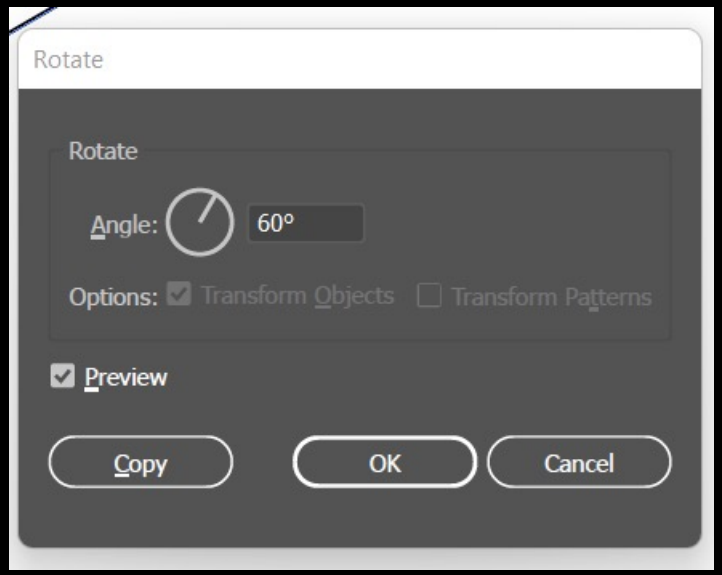
9- Alt tuşunu basılı tutarken, döndürme işleminin bağlantı noktasını konumlandırmak için en soldaki grubun merkezini seçin.

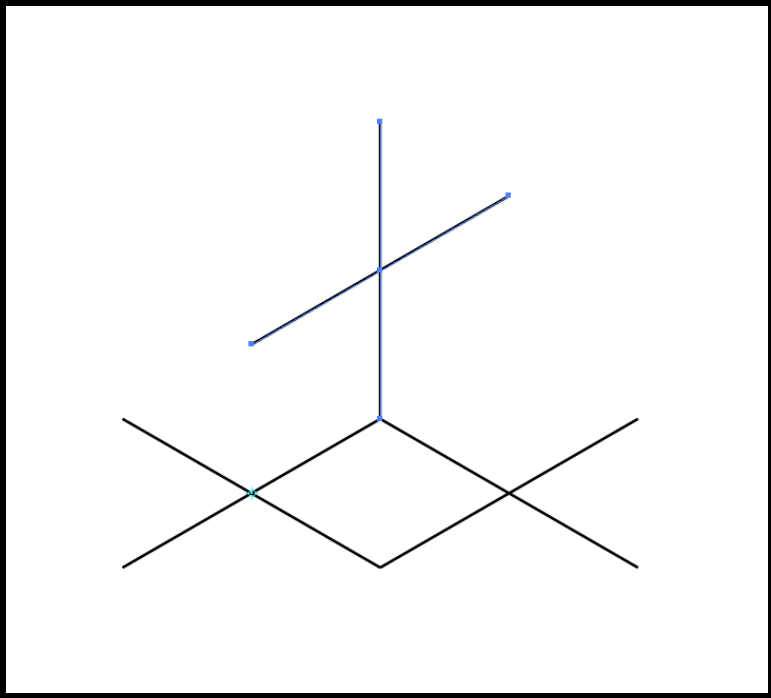


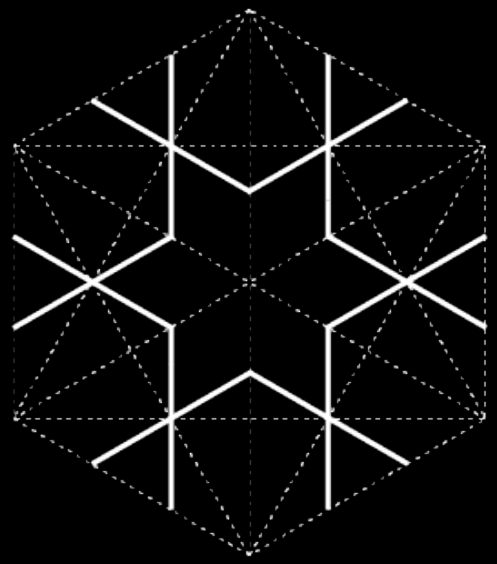


Illustrator İş Akışı

10- Rotation 60 derece ile uygula ve kopyala seçeneği

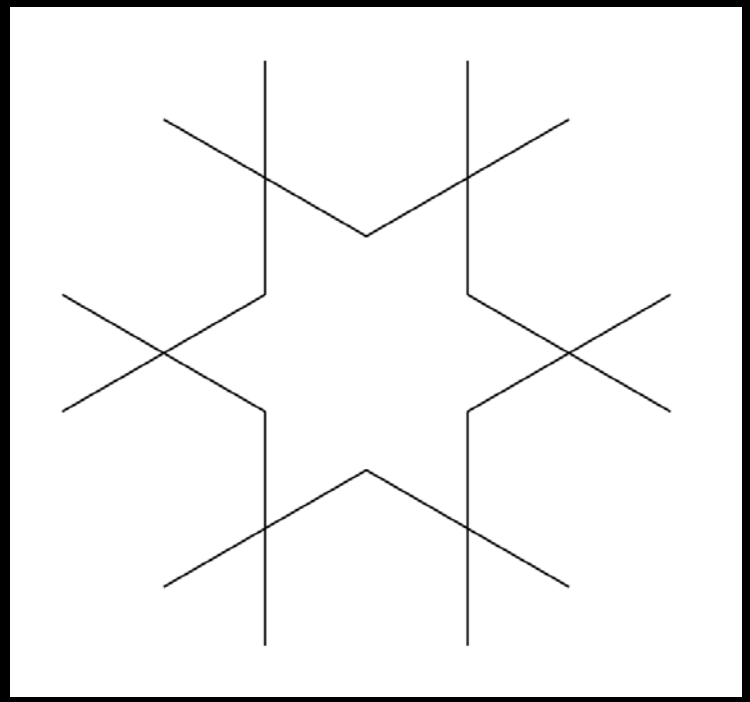






Illustrator İş Akışı

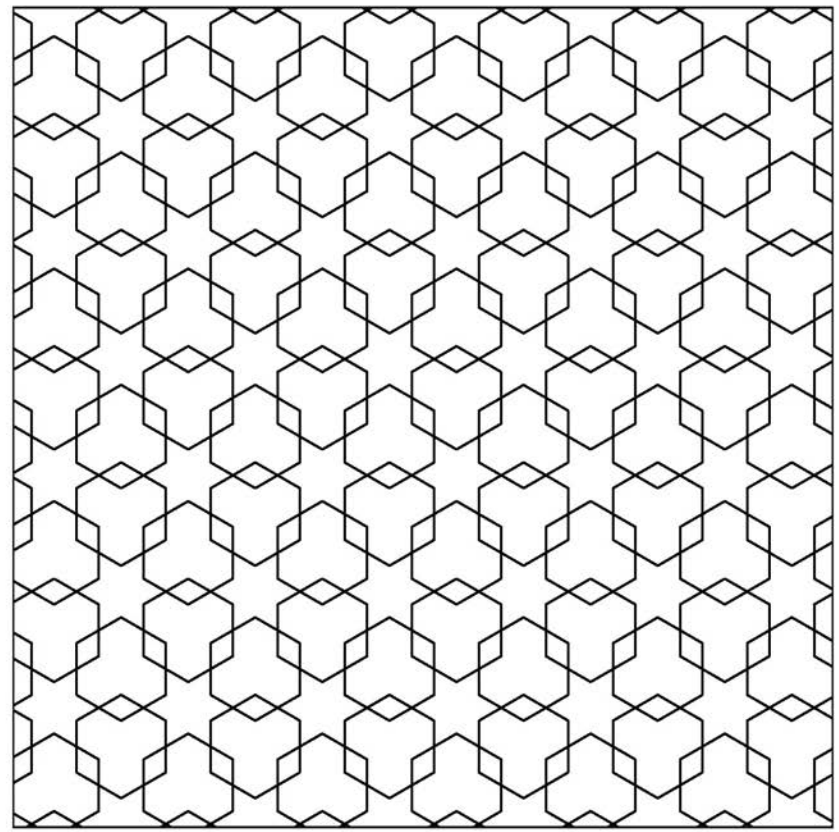
11- Kalan taraflara döndürme uygulamak ve ortadaki şekli silmek için Ctrl + D'yi tekrarlayın. Final!



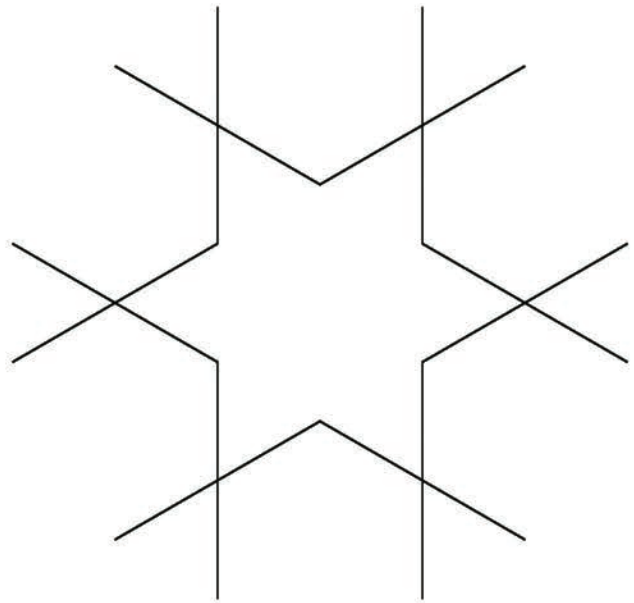
p5js iş akışı

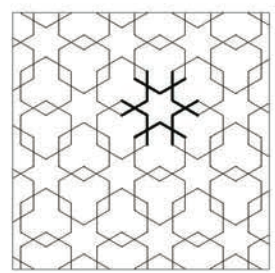
Geometrik Desen Üretme İş Akışı #1

Geometrik deseni inceleyin ve yapıtaşlarını analiz etmeye çalışın

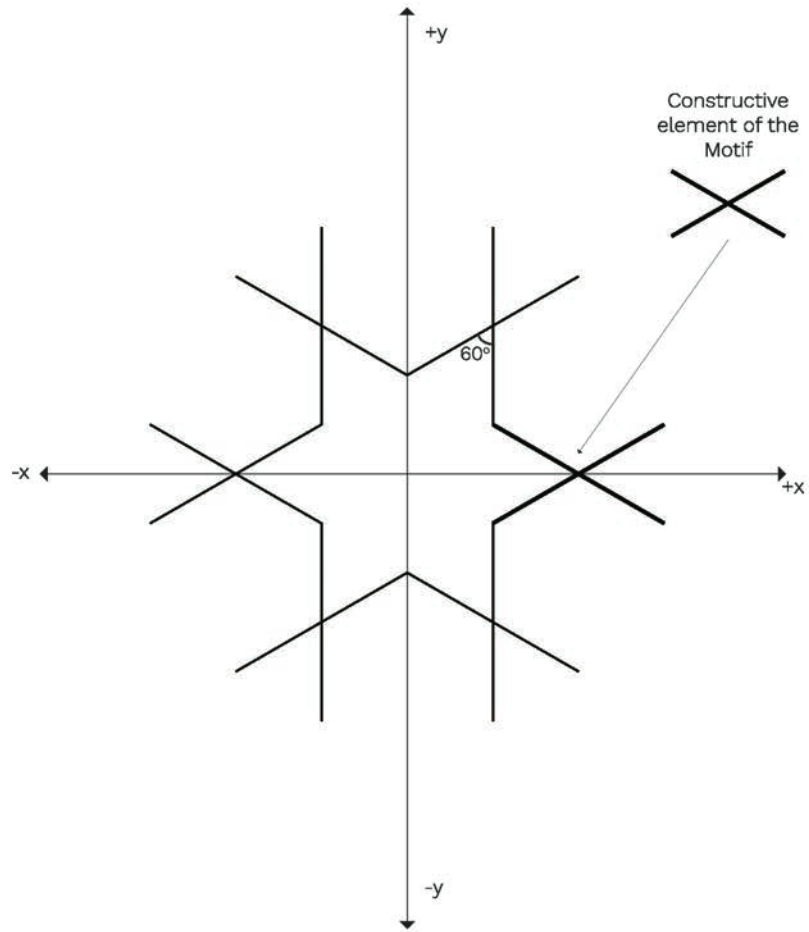


Motif





Temel Görsel Bileşini İnceleyelim



Açıları ve Vertex noktalarını tespit etmek

Aşama 1 : Vertex noktalarını bulalım

x_1= a x cos(30°)

y_1 = a x sin(30°)

x_2 = -x_1

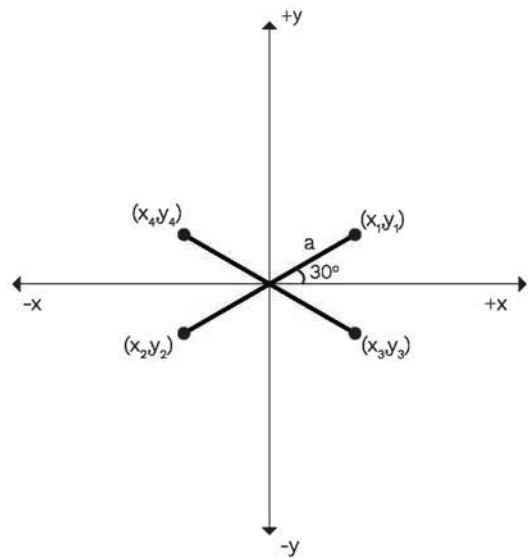
y_2 = -y_1

x_3 = x_1

y_3 = y_2

x_4 = x_2

y_4 = y_1



Motifi Oluşturmak

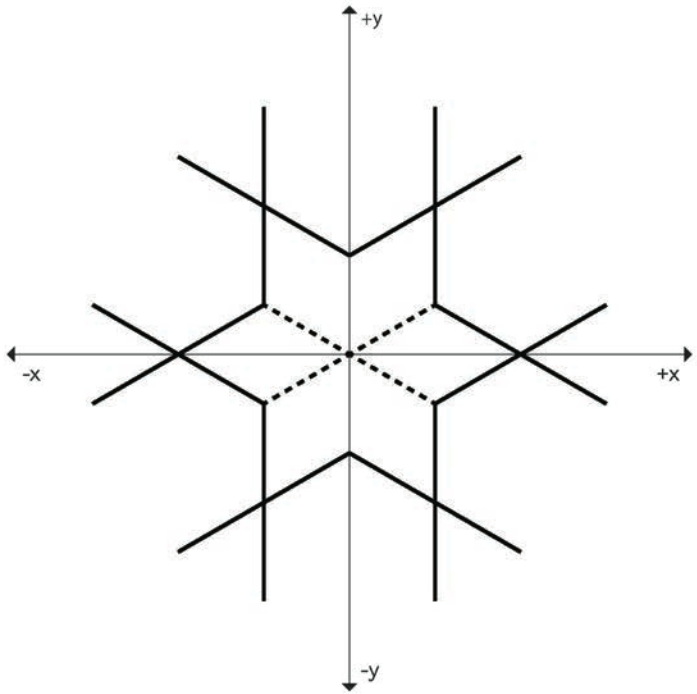
Aşama 2 : Temel Görsel Bileşeni çizmeye çalışalım. İki tane kesişen doğrudan oluşuyor.

```
let a = 30;

function setup() {
	createCanvas(600, 600);
	angleMode(DEGREES);
}
function draw() {
	let x1,y1,x2,y2,x3,y3,x4,y4;
	background(255);
	push();
		translate(width*0.5, height*0.5);
		//line one
		beginShape();
		x1 = a * cos(30);
		y1 = a * sin(30);
		vertex(x1,y1);
		x2 = -1 * x1;
		y2 = -1 * y1;
		vertex(x2,y2);
		endShape();
		//line two
		beginShape();
		x3 = x1;
		y3 = y2;
		vertex(x3,y3);
		x4 = x2;
		y4 = y1;
		vertex(x4,y4);
		endShape();
	pop();
}
```

Motifi Oluşturmak

Aşama 3 : Motifi, Temel Görsel Bileşeni kullanarak transformasyon fonksiyonları yardımı ile oluşturalım.

Algoritma: Temel Görsel Bileşeni yarı genişliğinde sağa kaydır. Merkez etrafında altı defa döndür.



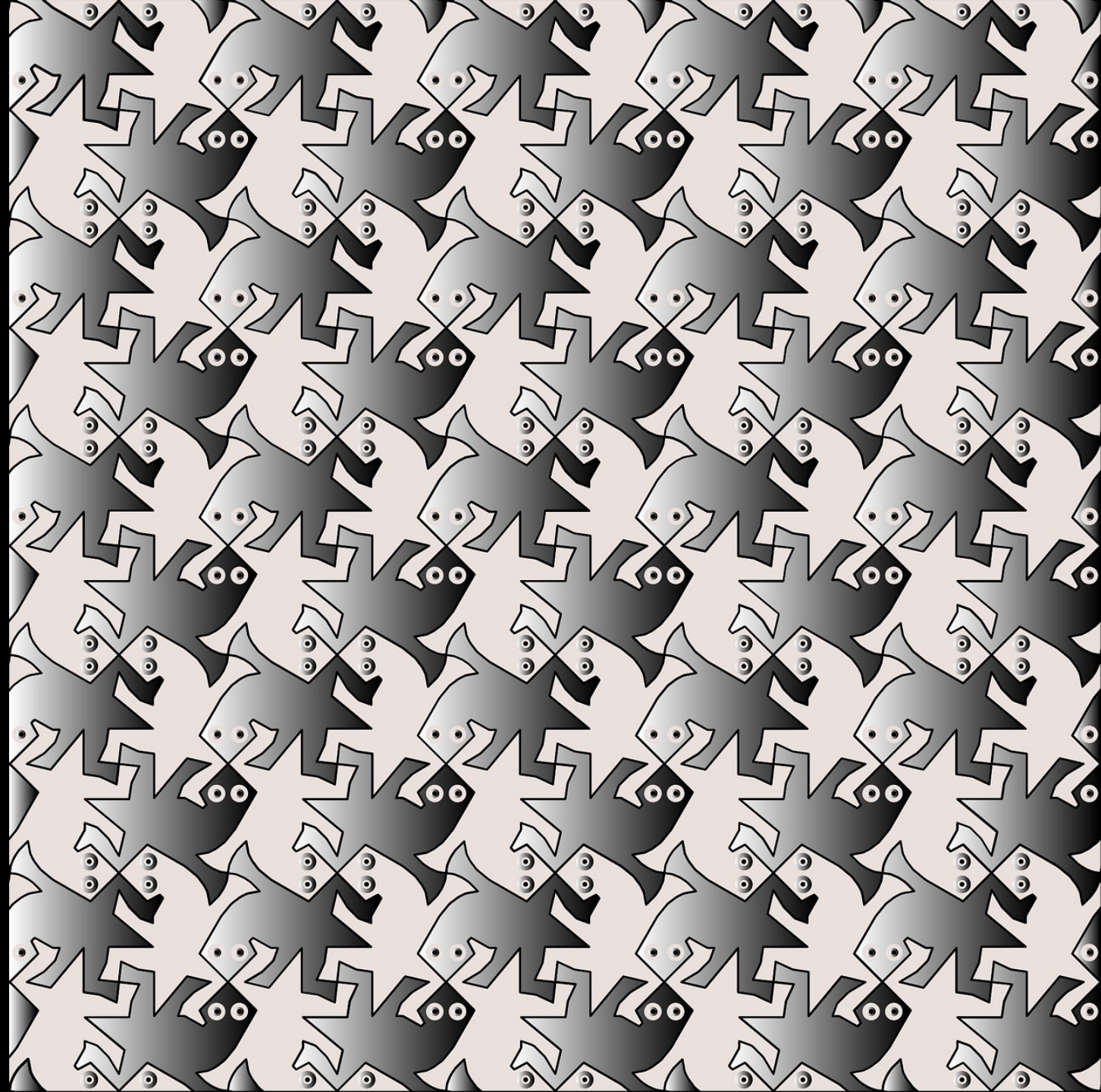
Motifi Oluşturmak

Aşama 4 : Motifi kodla oluşturmak için 6 tekrarlı bir loop döngüsü kullanacağız. Unutmayın transformasyon fonksiyonlarının sırası önemli!

```
let a = 30;

function setup() {
        createCanvas(400, 400);
        angleMode(DEGREES);
}
function draw() {
        let x1,y1,x2,y2,x3,y3,x4,y4;
        background(255);
        push();
                translate(width*0.5, height*0.5);
                for(let i=0; i<6; i++){
                push();
                        rotate(i*60);
                        //move to the right by its width size
                        translate(cos(30)*a*2,0);
                        //line one
                        beginShape();
                        x1 = a * cos(30);
                        y1 = a * sin(30);
                        vertex(x1,y1);
                        x2 = -1 * x1;
                        y2 = -1 * y1;
                        vertex(x2,y2);
                        endShape();
                        //line two
                        beginShape();
                        x3 = x1;
                        y3 = y2;
                        vertex(x3,y3);
                        x4 = x2;
                        y4 = y1;
                        vertex(x4,y4);
                        endShape();
                pop();
                }
    pop();
}
```

Bezeme

Bezeme, motif adı verilen bir veya daha fazla geometrik şekil kullanılarak, üst üste binme ve boşluk olmaksızın bir yüzeyin, genellikle bir düzlemin kaplanmasıdır.



Bezeme p5.js

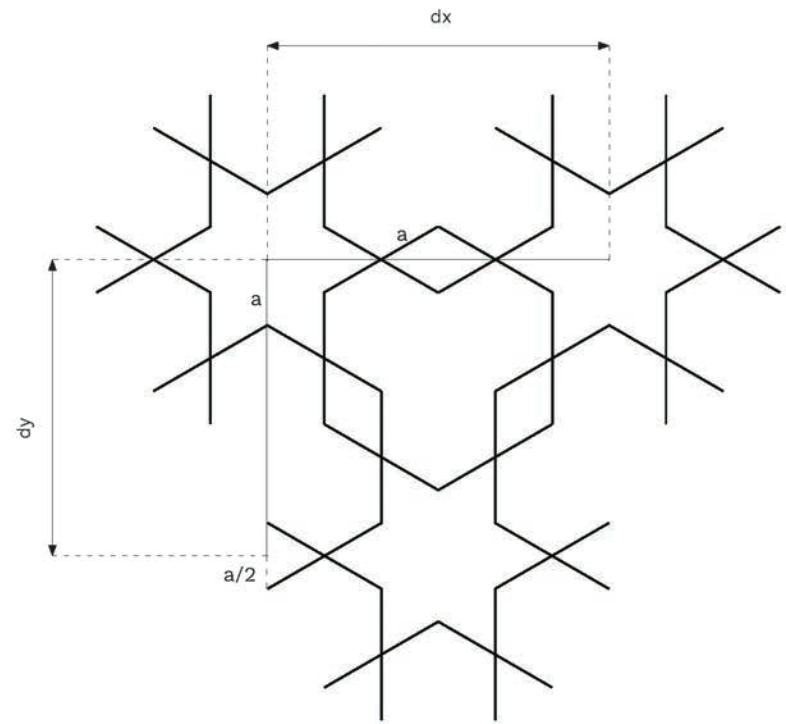
```
class Rectangle {
  constructor(name, height, width) {
    this.name = name;
    this.height = height;
    this.width = width;
  }
}

let square = new Rectangle('square', 1, 1); // creating new
instance of Polygon Class.
console.log(square.width); // prints '1' to the console
```

Bezeme p5.js

```
let bug; // Declare object
function setup() {
	createCanvas(710, 400);  // Create object
	bug = new Jitter();
}
function draw() {
	background(50, 89, 100);
	bug.move();
	bug.display();
}
```

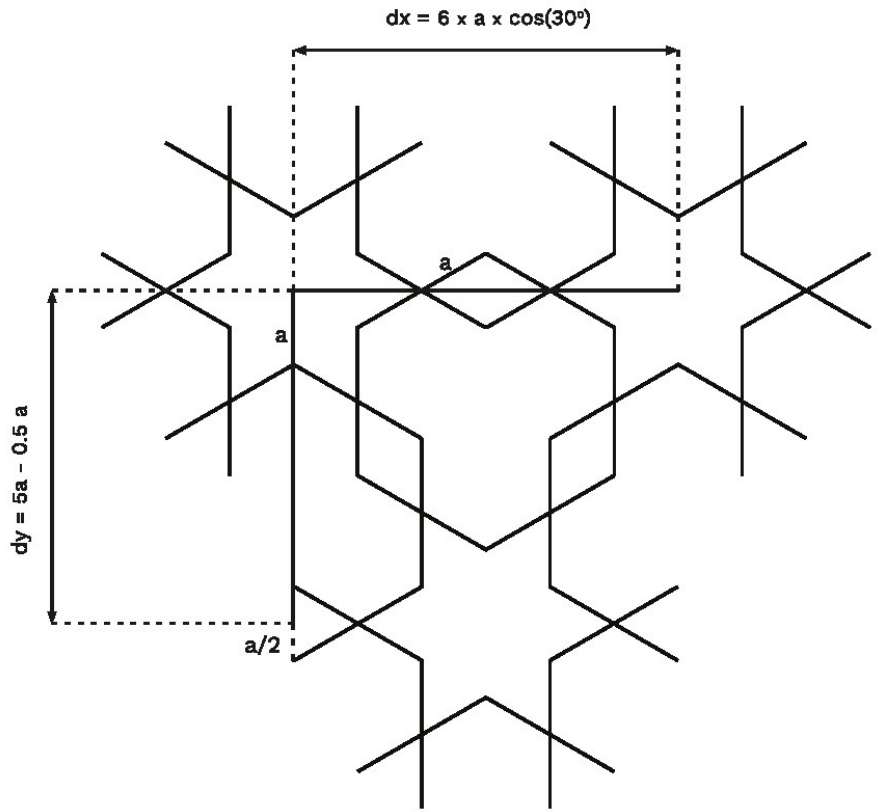
```
// Jitter class
class Jitter {
	constructor() {
		this.x = random(width);
		this.y = random(height);
		this.diameter = random(10, 30);
		this.speed = 1;
	}

	move() {
		this.x += random(-this.speed, this.speed);
		this.y += random(-this.speed, this.speed);
	}

	display() {
		ellipse(this.x, this.y, this.diameter, this.diameter);
	}
}
```

Bezemeyi Analiz Edelim



Analyzing the Tessellation

Step 5: We need to calculate the dx, dy, and doff values in the placement.

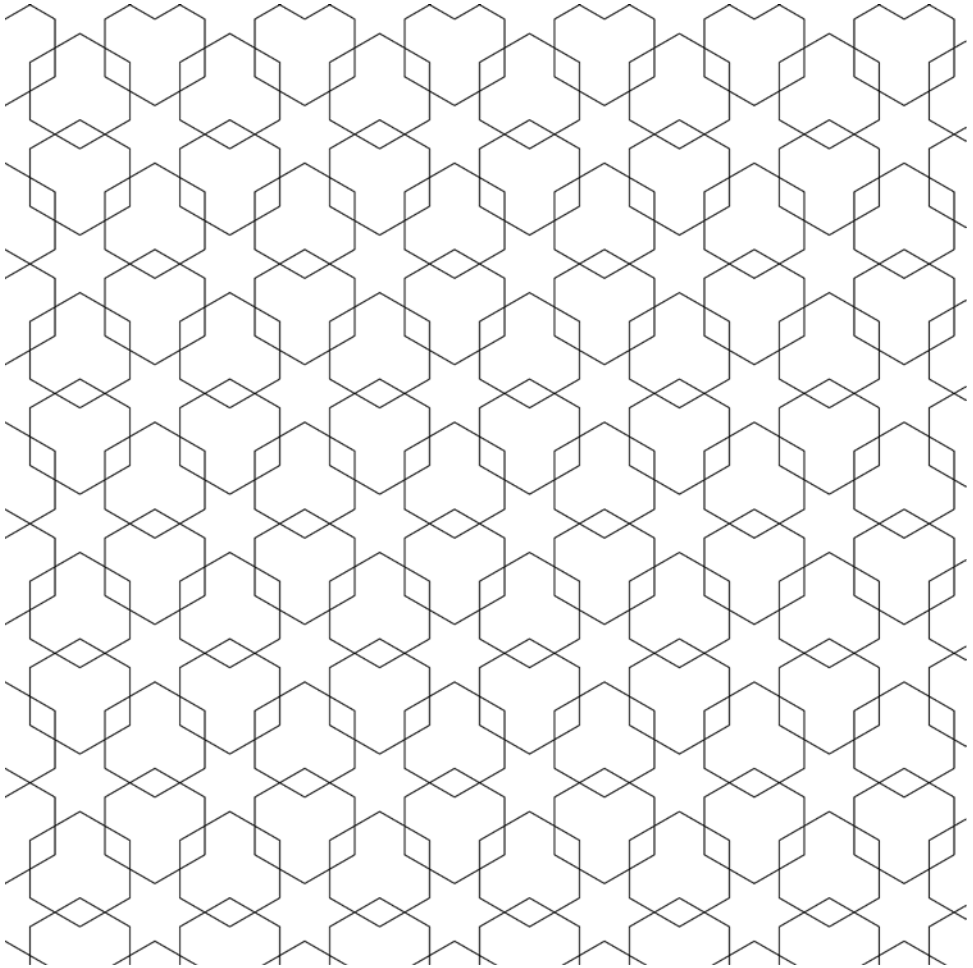


Tessellation Code

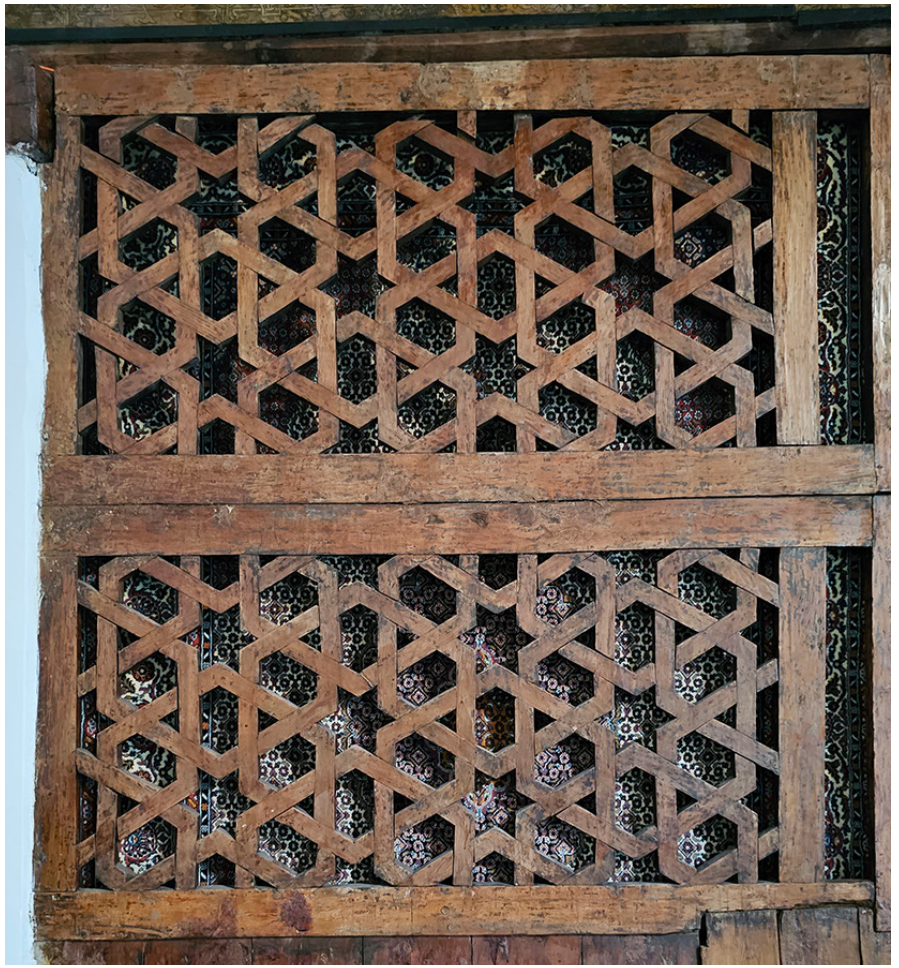
```
// Motif class
class Motif {
  constructor(a) {
      this.a = a;
  }

  display() {
       let x0, y0, x1, y1, x2, y2, x3, y3;
       for (let i = 0; i < 6; i++) {
           push();
               rotate(i * 60);
               translate(cos(30) * this.a * 2, 0);
               //line one
               beginShape();
               x0 = this.a * cos(30);
               y0 = this.a * sin(30);
               vertex(x0, y0);
               x1 = -1 * x0;
               y1 = -1 * y0;
               vertex(x1, y1);
               endShape();
               //line two
               beginShape();
               x2 = x0;
               y2 = y1;
               vertex(x2, y2);
               x3 = x1;
               y3 = y0;
               vertex(x3, y3);
               endShape();
           pop();
       }
  }
}
```



```
//scale factor
let a = 24;
let motif = new Motif(a);
let nRow;
let nCol;
let dx, dy;

function setup() {
  createCanvas(800, 800);
  angleMode(DEGREES);
  noFill();
  noLoop();

  dx = 6 * a * cos(30);
  dy = 4.5 * a;
  doff = 0.5 * dx;

  //approximate the nRow and nCol values
  nCol = ceil(width / dx);
  nRow = ceil(height / dy);
}

function draw() {
  for (let c = 0; c < nCol; c++) {
    for (let r = 0; r < nRow; r++) {
      push();
        if (r % 2 == 0) {
          //columns 0,2,4
          translate(doff, 0);
        }
        translate(c*dx,r*dy);
        motif.display();
      pop();
    }
  }
}
```



vs



- Örnek: İslam Sanatı Geometrik Desen / Eşrefoğlu Camii, Beyşehir

Ödev: El Çizimi

Teşekkürler.
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