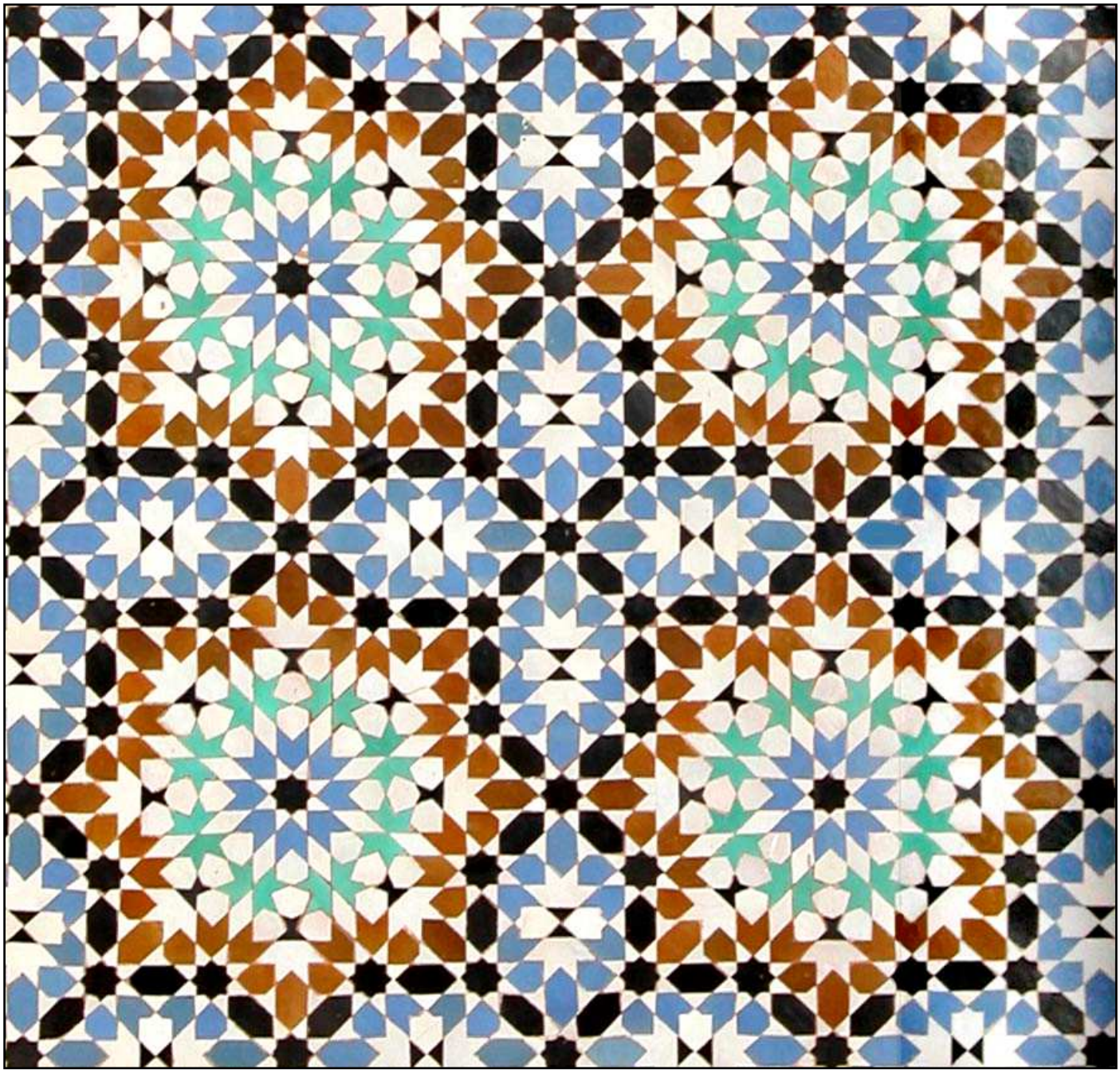
La géométrie des Arabesques



III. DESSIN :
SYSTEME MODULAIRE CONVERGENT



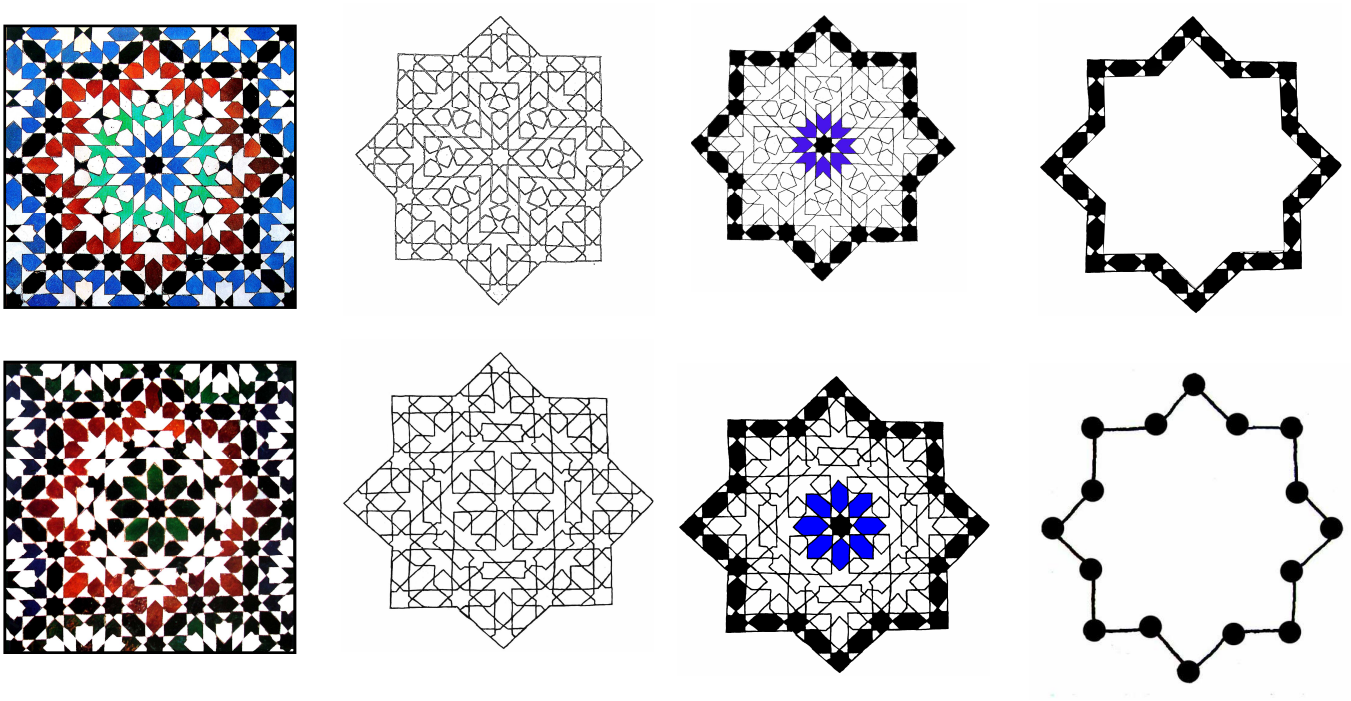
Zelliges de la fontaine de la tour Hassan à Rabat.

En Afrique du nord, sous les Mérinides, et en Andalousie, sous les Nasrides, une autre technique originale d'assemblage géométrique s'est développée, obéissant à des règles strictes : c'est le **système modulaire convergent andalou**.

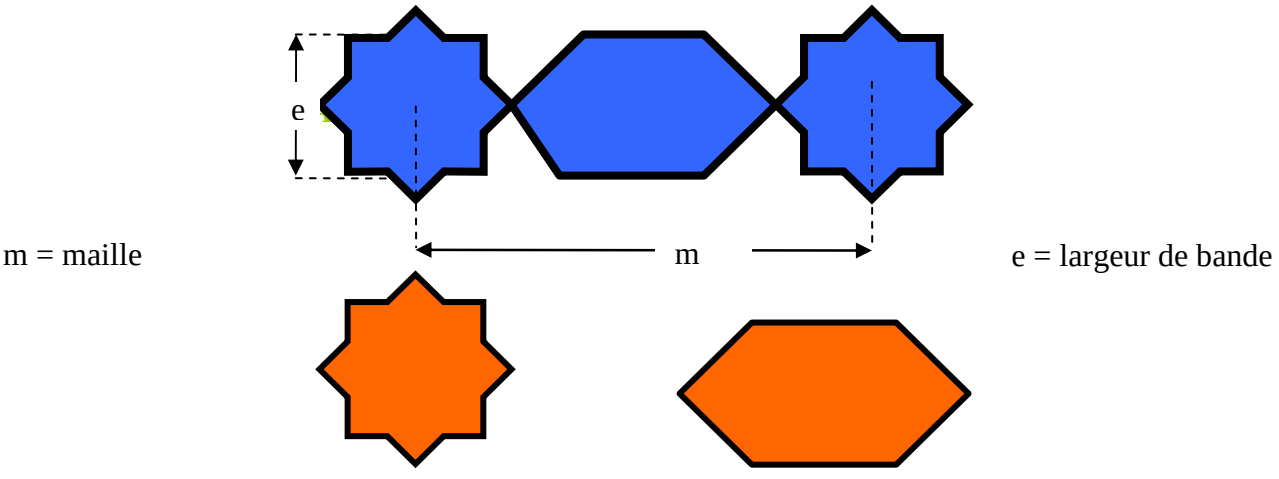
En Perse, à Kashin, à Ispahan, et en Turquie à Iznik, se sont développés au début du XIV ème siècle des modèles décoratifs floraux et structurés avec des constructions géométriques obéissant à des règles bien précises : c'est **le système convergent persan**.

- *Étude des « squelettes » : exemple 1.*

- Les ensembles géométriques sont construits à partir de squelettes : ce squelette est formé d'une succession de deux pièces fondamentales : le *sceau* et le *saft*.
- Les squelettes sont fermés
- La distance **m** entre le centre des deux sceaux est appelée *la maille* **m** *du motif*
- La largeur du saft et du sceau est formé d'une *bande* de largeur **e**
- Dans la plupart des motifs de symétrie d'ordre 4, les différents squelettes se combinent entre eux pour former des structures complexes.
- Ils seront représentés par un schéma simple :

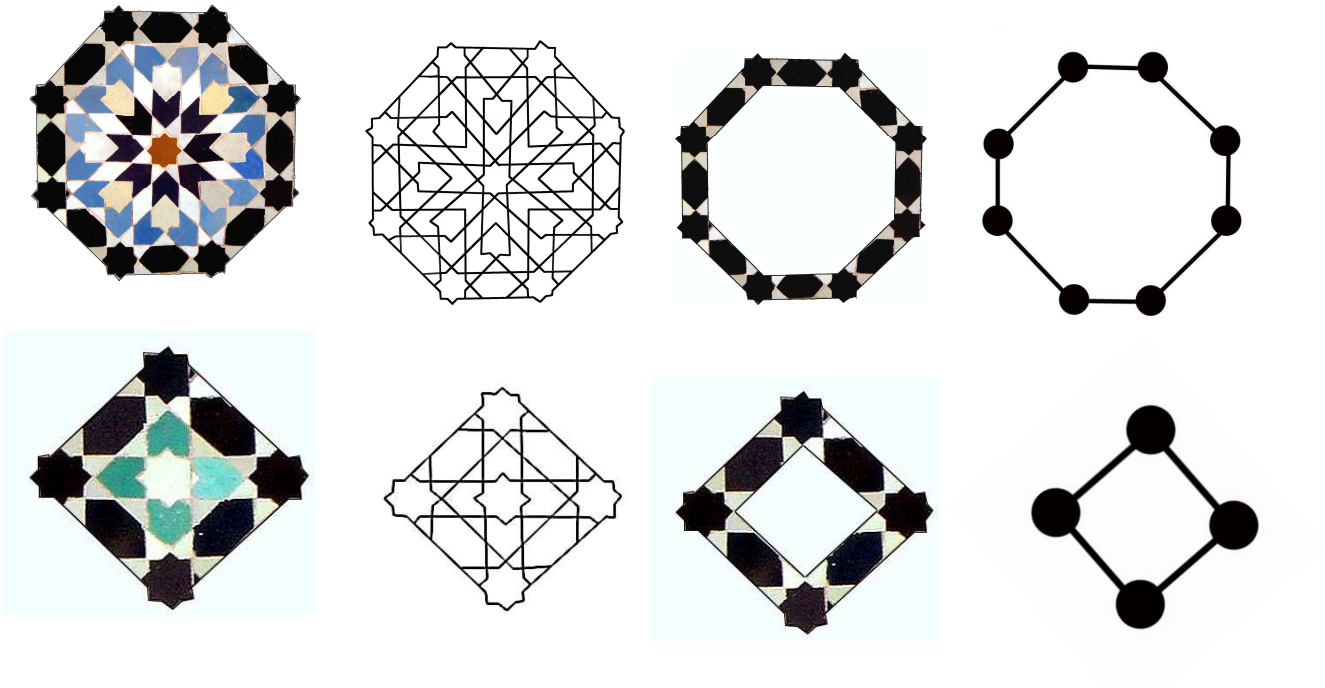


SCEAU **MAILLE**



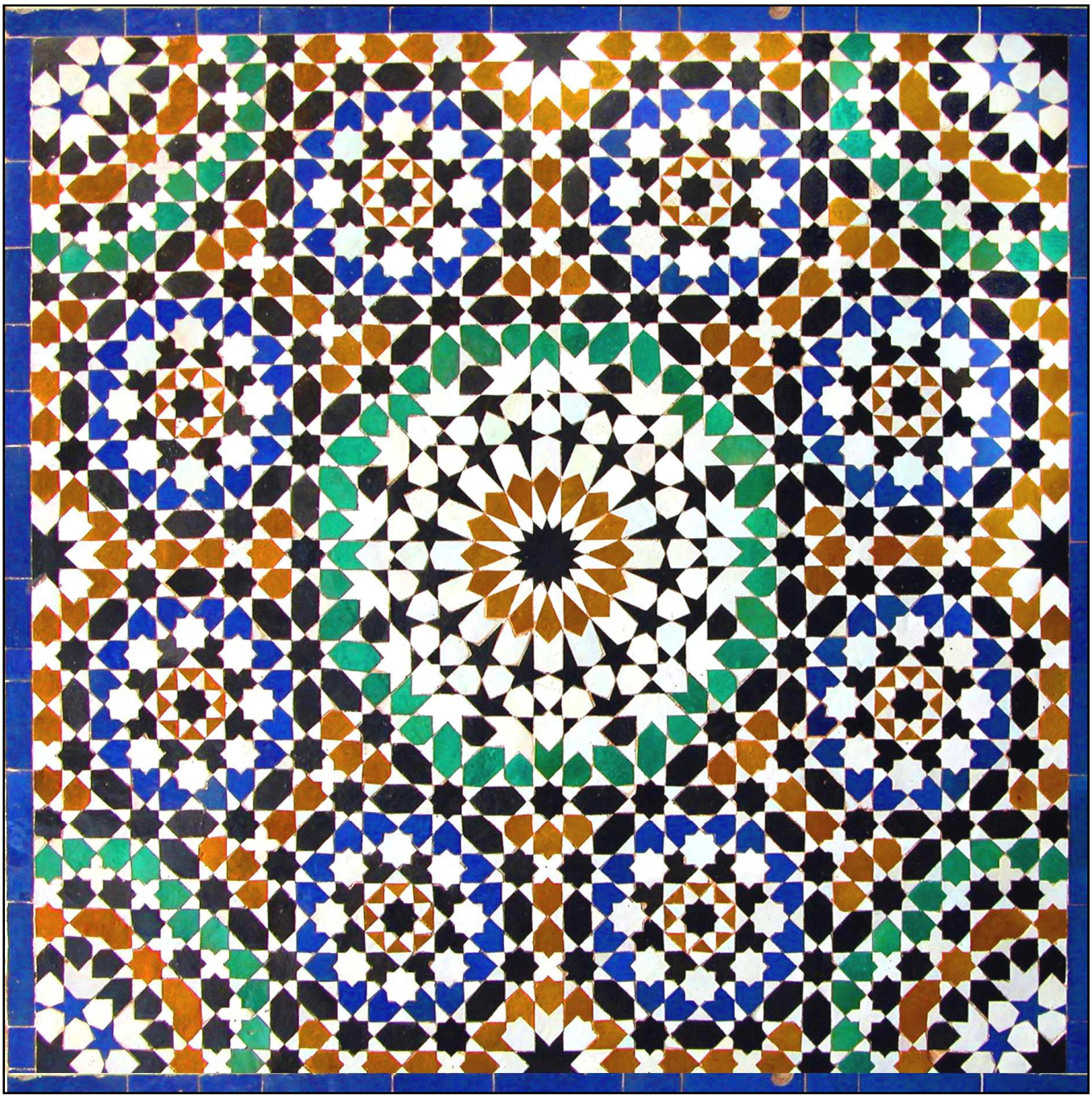
- *Étude des squelettes : exemple 2.*

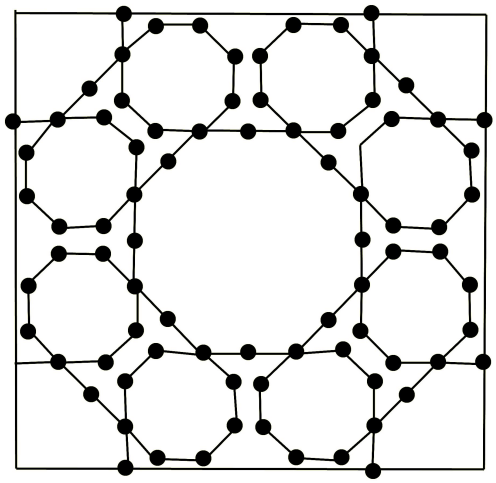




Cette mosaïque, qui provient de la médersa ben Youssef à Marrakech, est formée par une composition d'octogones simples.

- *Étude des squelettes : exemple 3.*

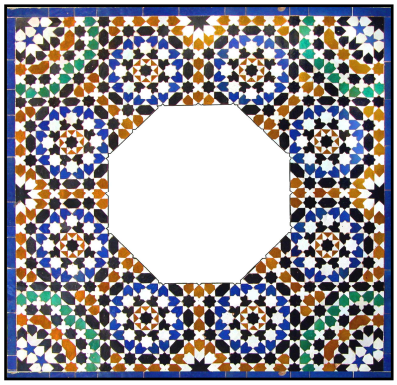
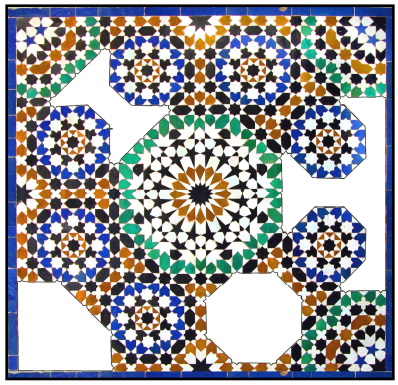
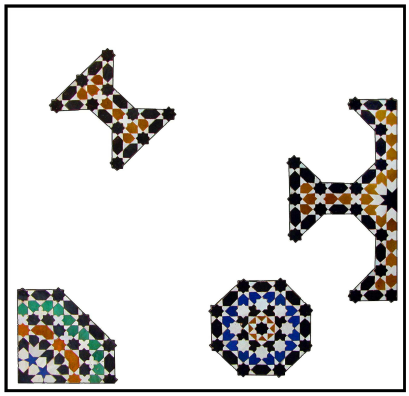
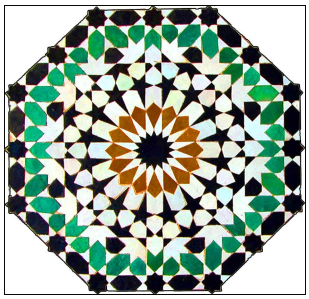
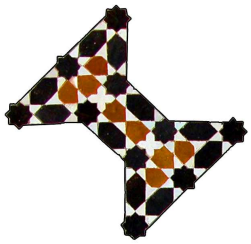
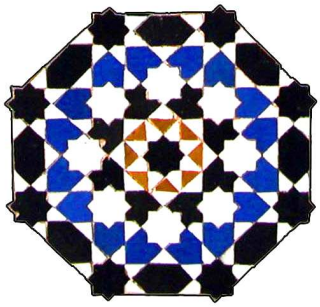
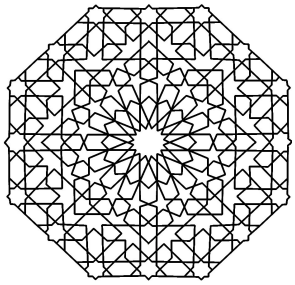
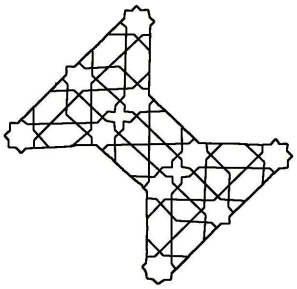
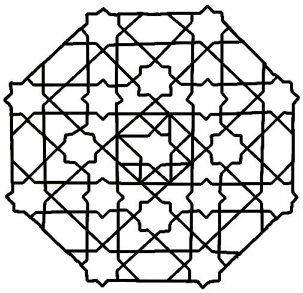
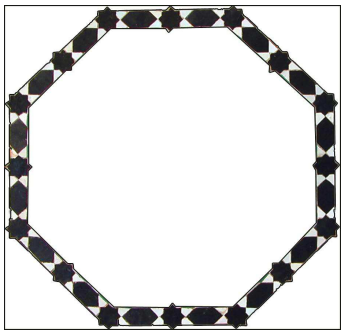
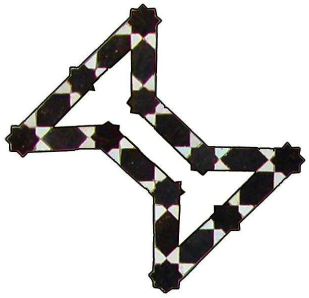
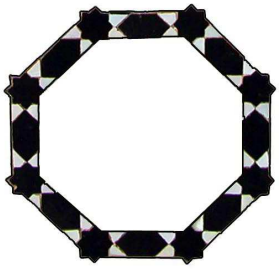
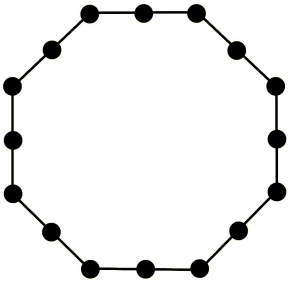
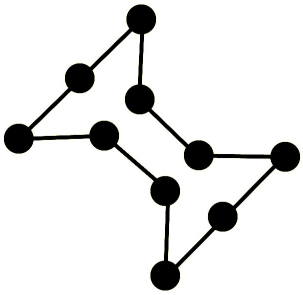
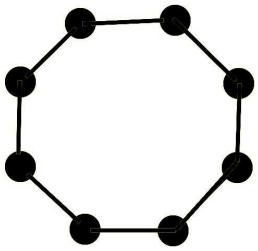




Palais de la Bahia à Marrakech.

La structure de cette mosaïque est parfaitement visible :

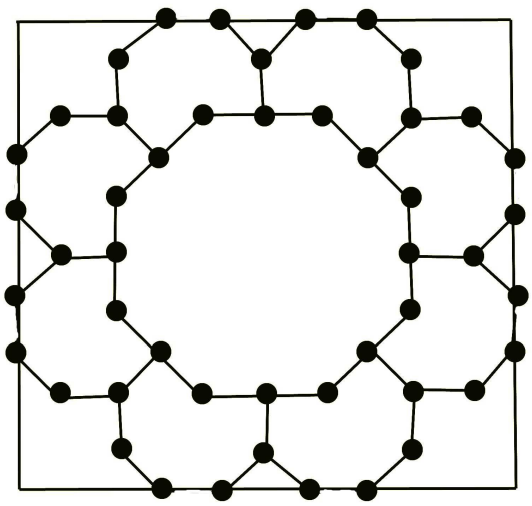
- Un octogone double au centre et aux angles un quart de ce même octogone.
- Une couronne d'octogones simples séparés par des éléments en forme de massues.

L’octogone double. *La massue.* *L’octogone simple.*

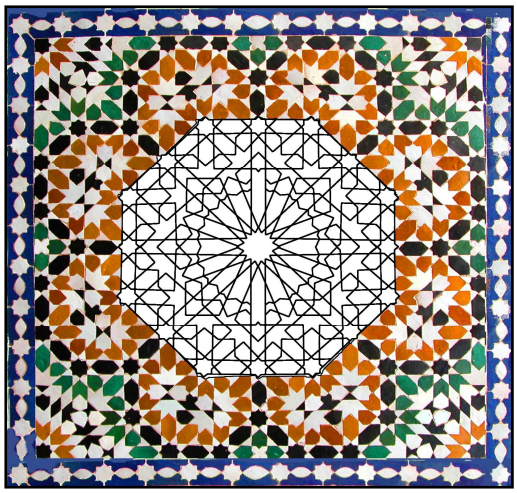
- *Étude des squelettes : exemple 4.*

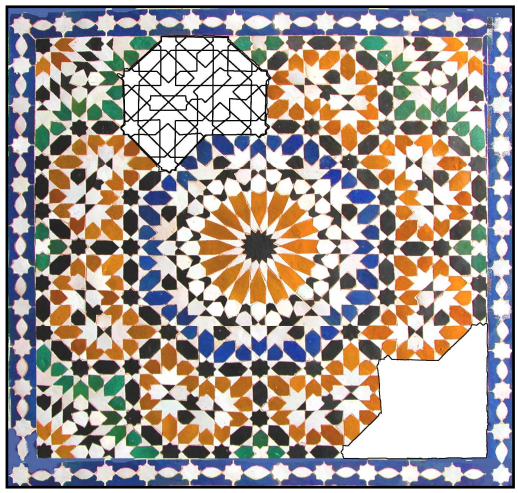


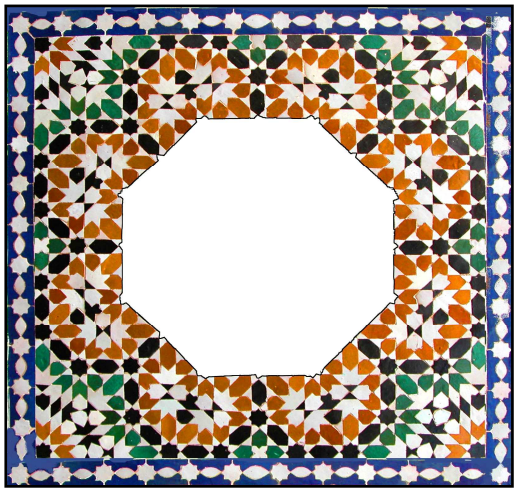


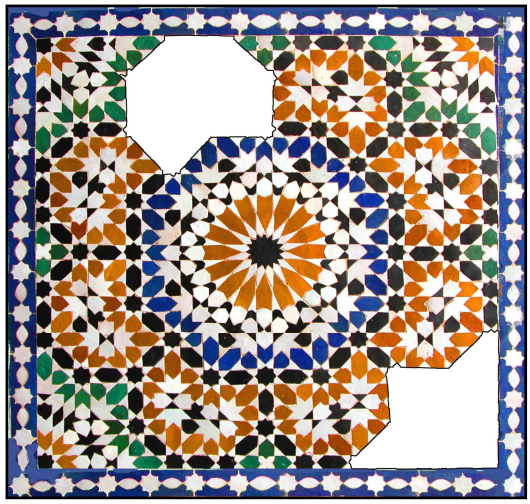
Palais de la Bahia de Marrakech.

Ce panneau est formé autour d'un octogone double central avec pour satellites des octogones simples tronqués.

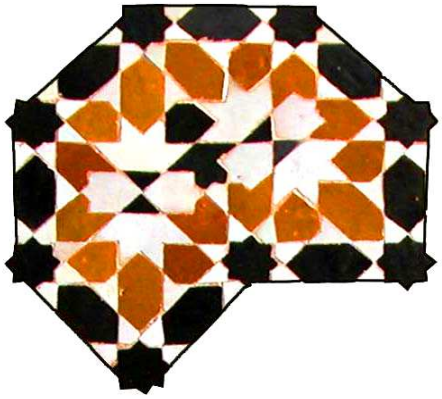


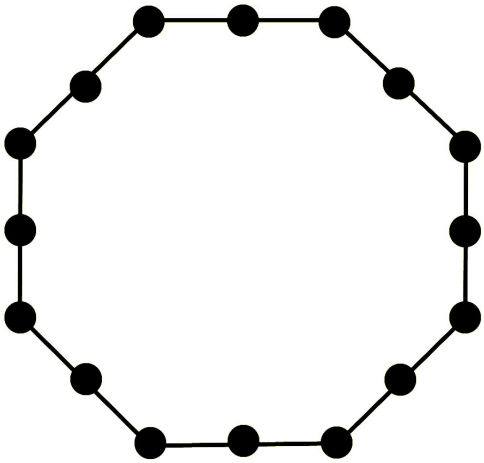


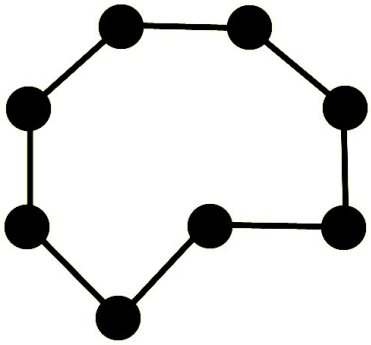




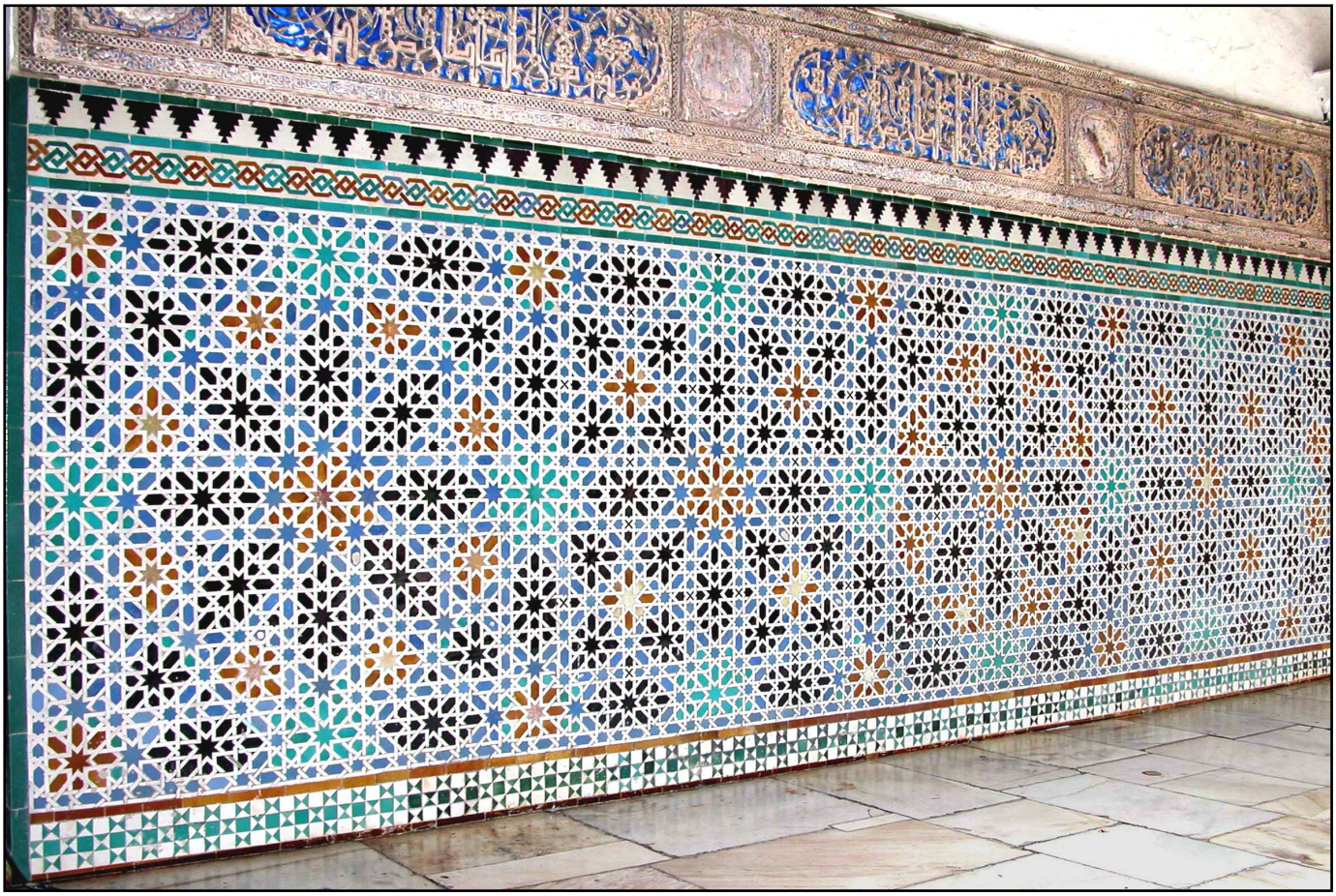


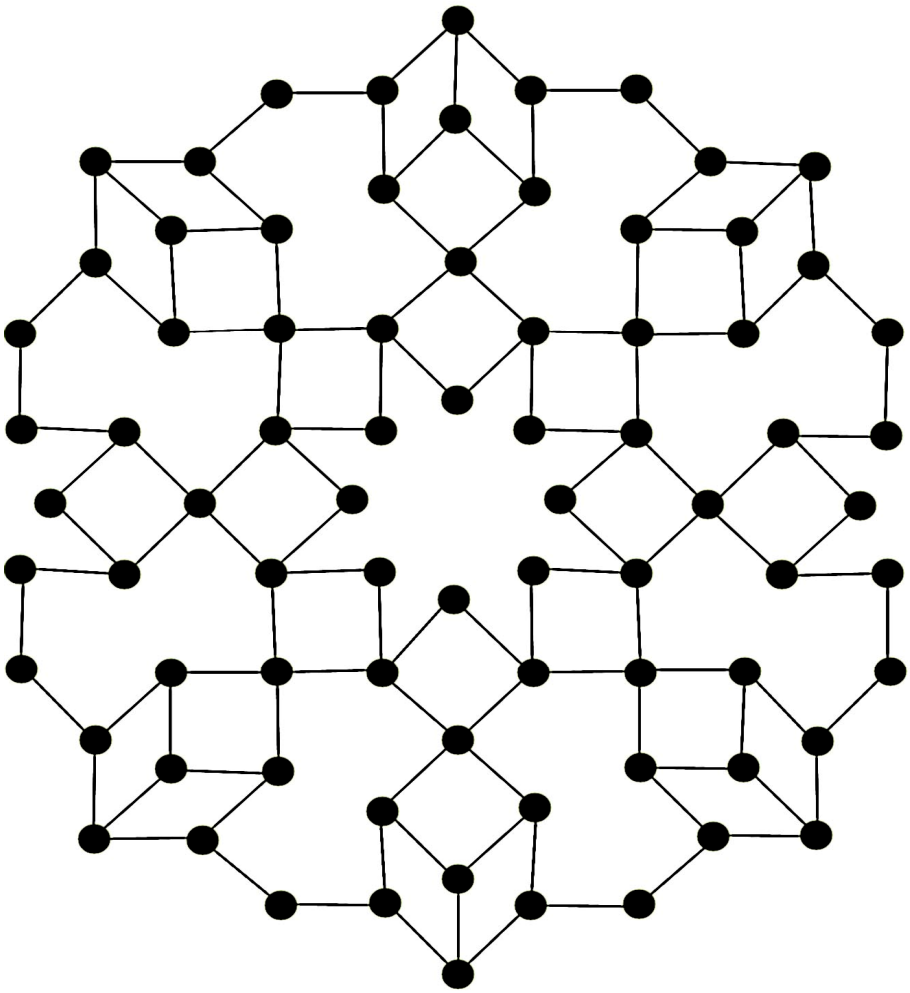






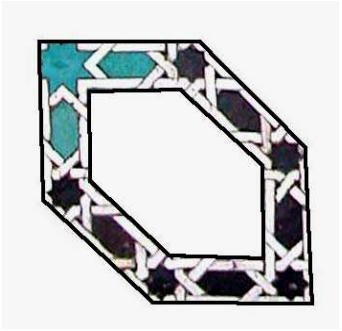
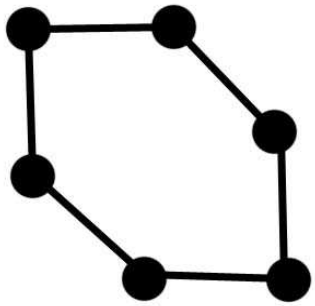
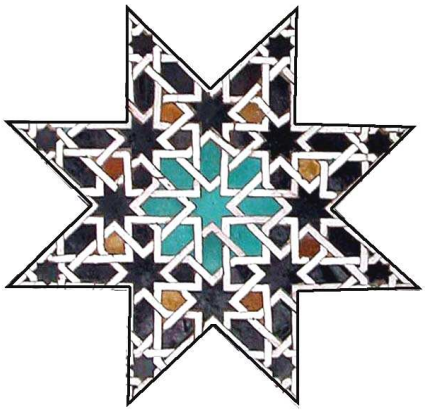
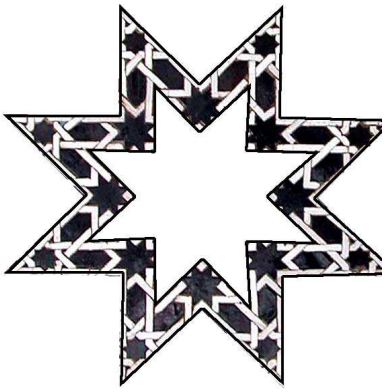
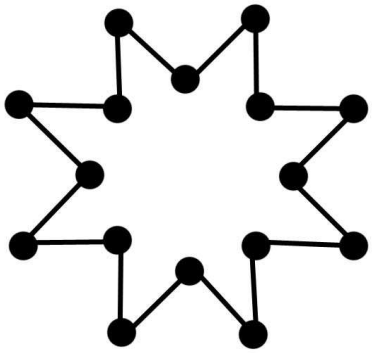
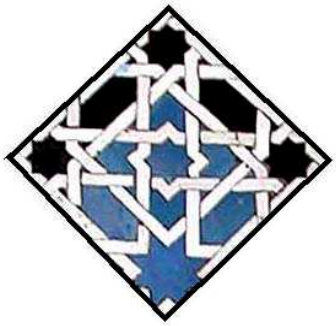
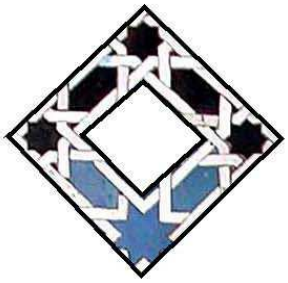
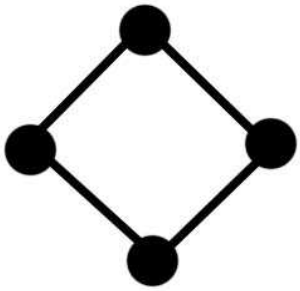
- *Étude des squelettes : exemple 5. Alcazar de Séville.*

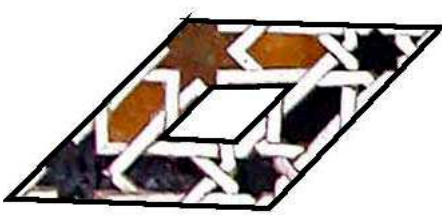
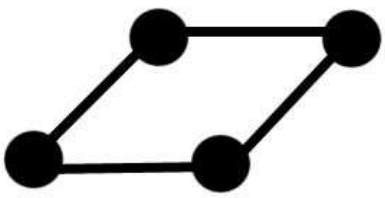




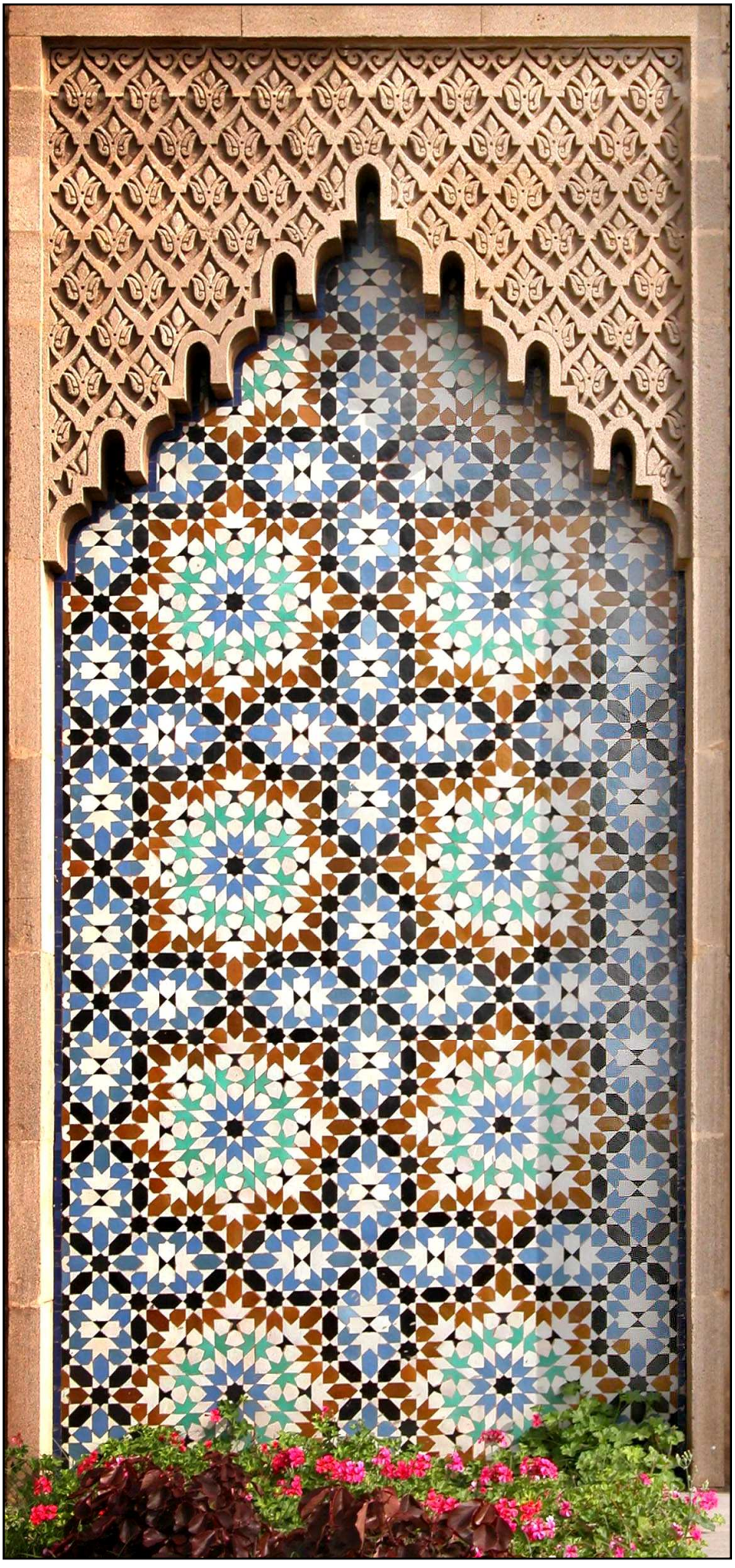
Ce panneau mural de près de soixante mètres couvre les trois côtés du Patio de Las Doncellas à l'Alcazar de Séville. Il parait formé d'une juxtaposition de rosaces similaires qui sont, en réalité, toutes différentes.

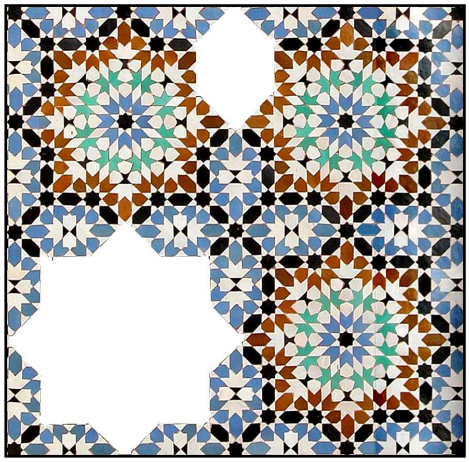
La suite de pièces de couleur noire semble former un squelette ; cela est inexact car le vrai squelette est caché derrière les couleurs ; il a été mis en évidence dans le schéma ci-contre.

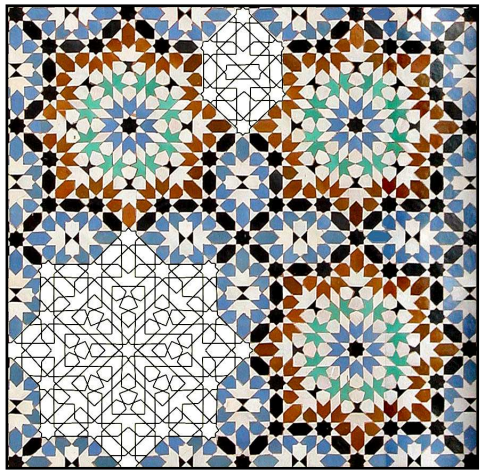










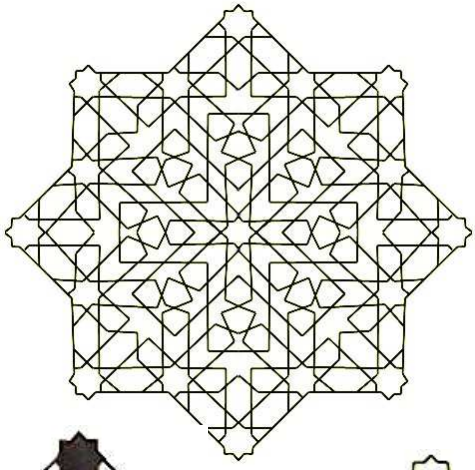



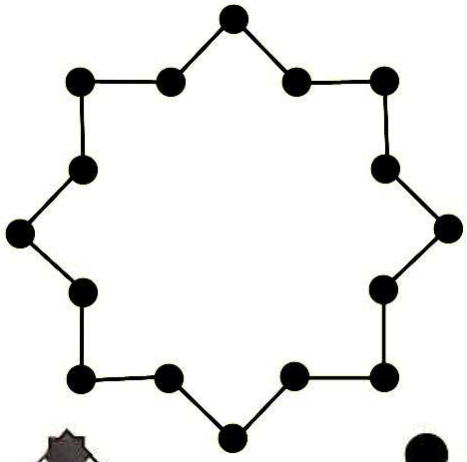
- *Étude des squelettes : exemple 6. Fontaine de la tour Hassan II*



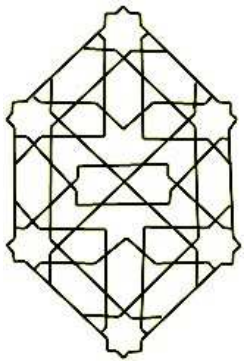




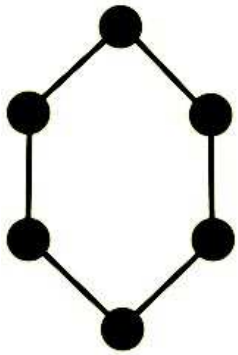


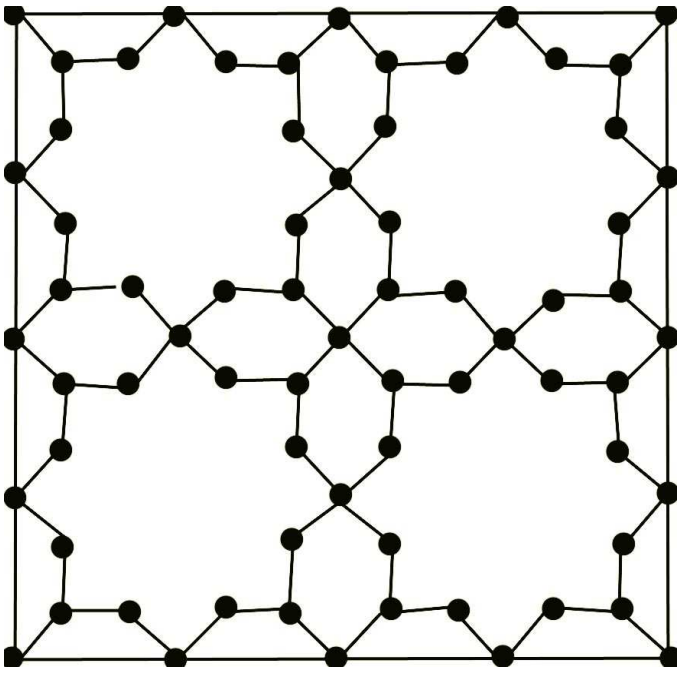






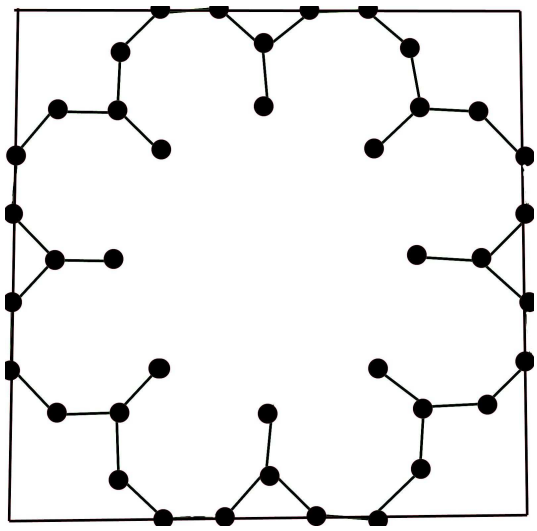






- *Étude des squelettes : exemple 7. La marguerite*





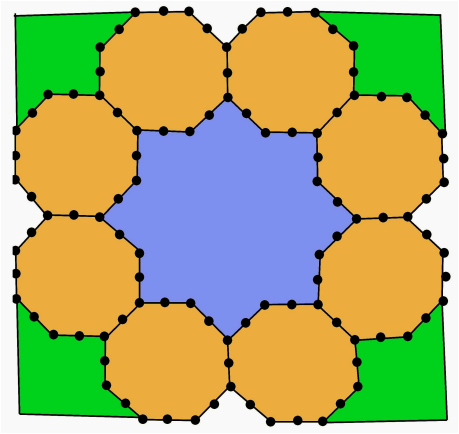
Palais de la Bahia. A Marrakech.

L'étoile centrale à vingt-quatre rayons est entourée d'un squelette dit en forme de marguerite. Les quatre coins du panneau sont occupés par un quart d'octogone étoilé.

- *Autres exemples de structures :*

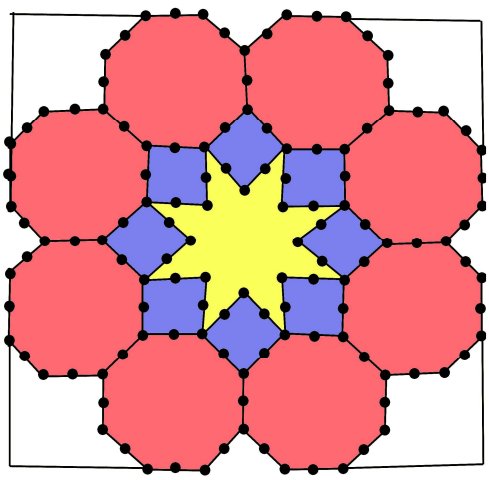


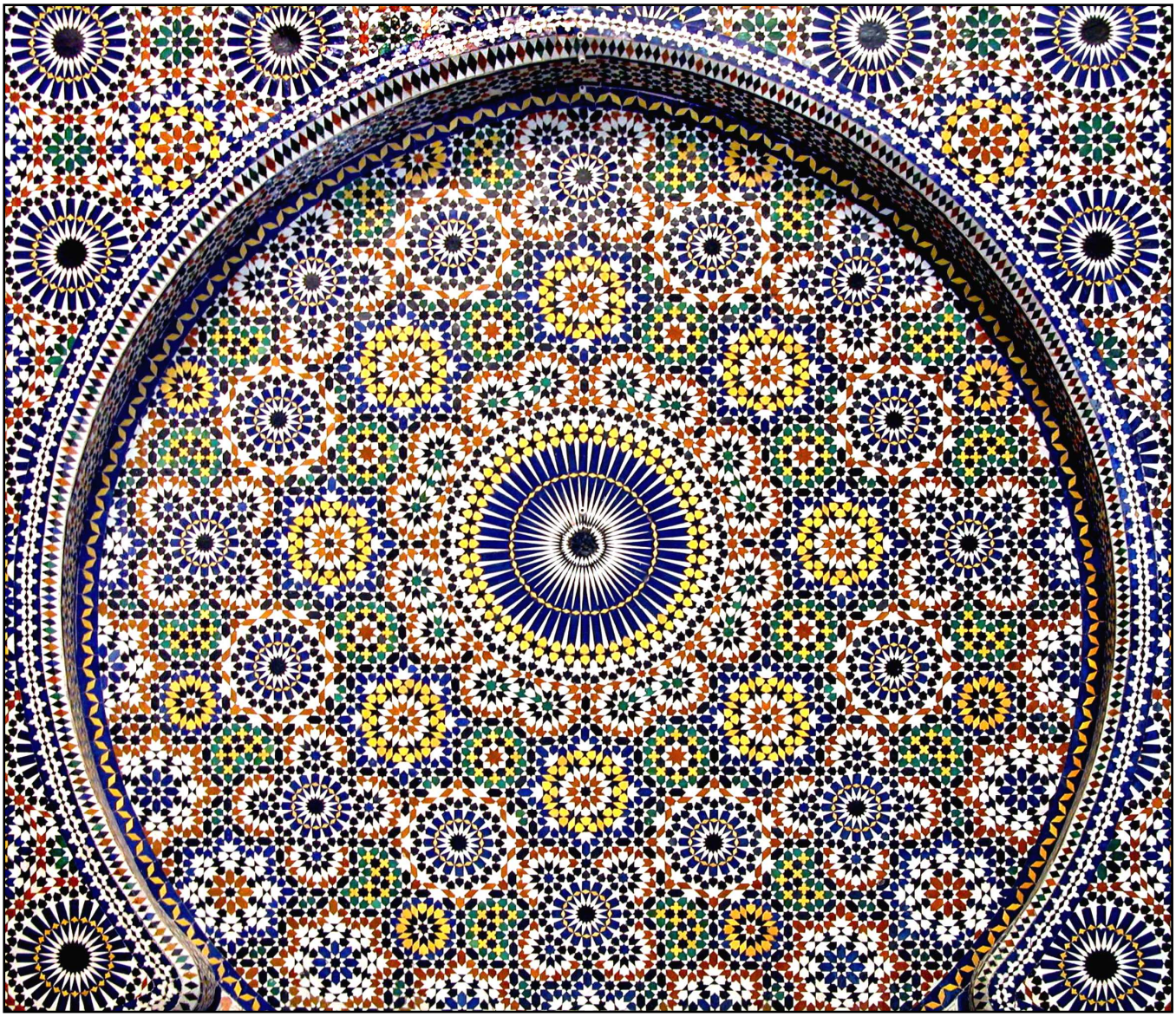
Mausolée Moulay Ismaïl à Mekhnès.



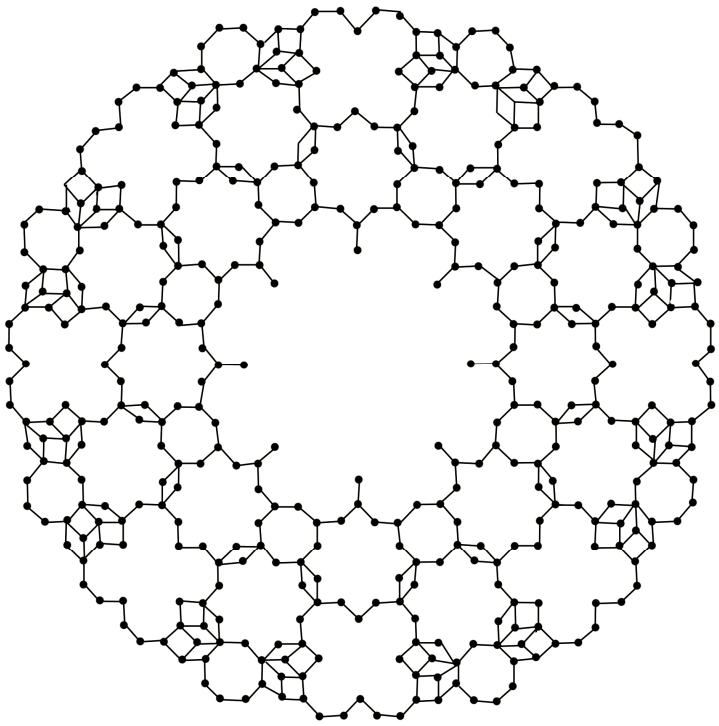


Mausolée Moulay Ismaïl à Mekhnès.

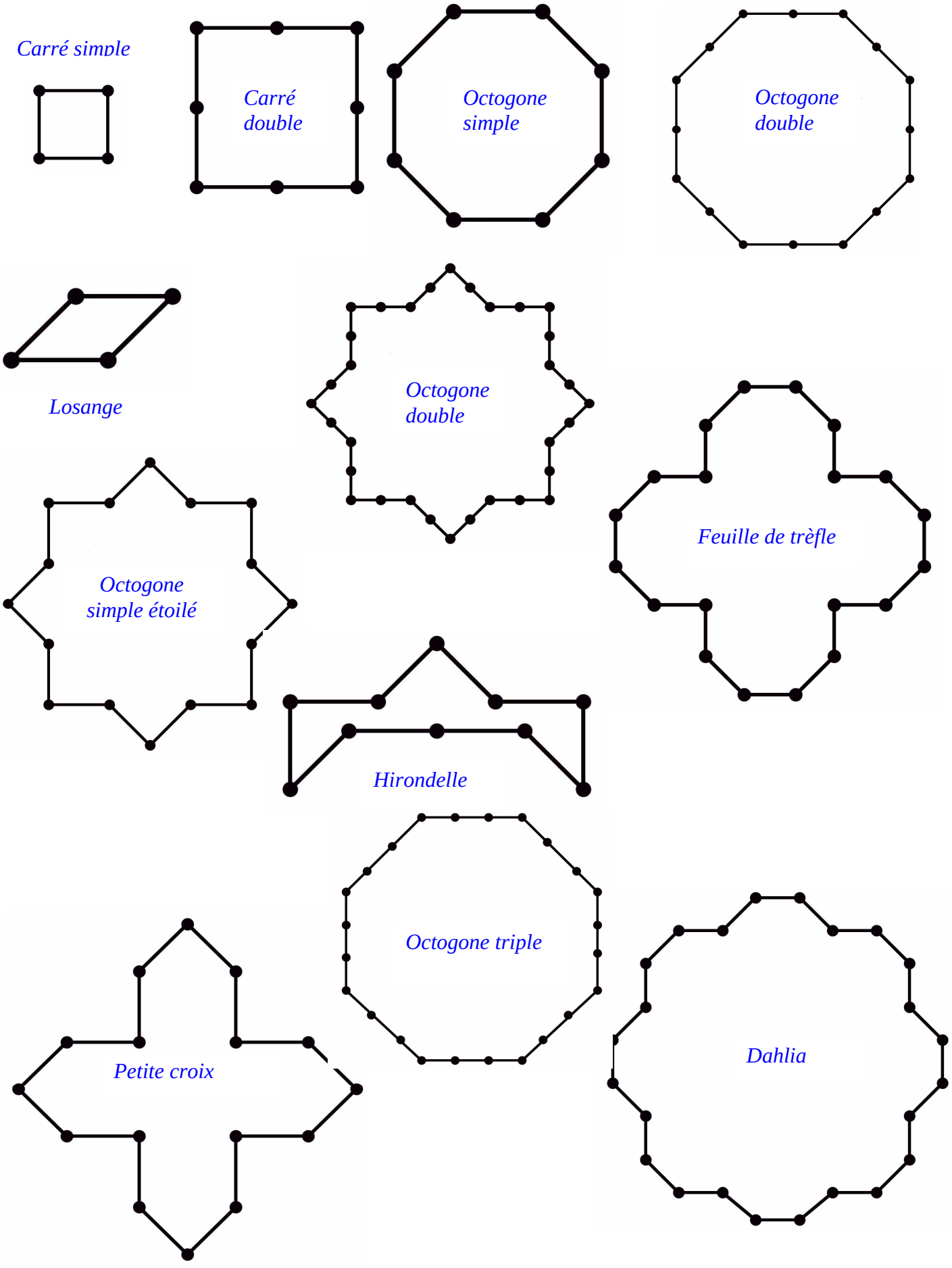




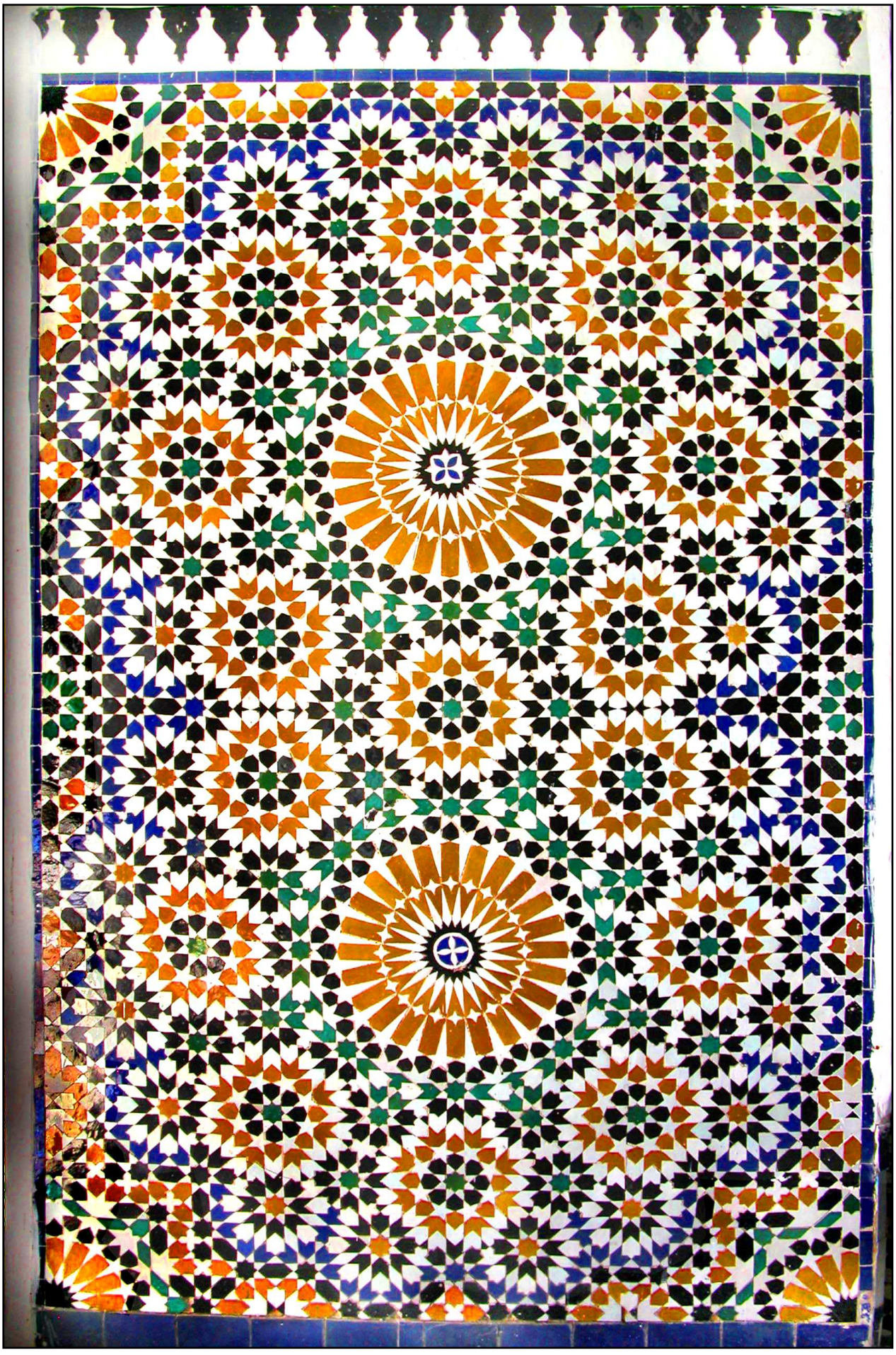
Fontaine du palais Mnebhi à Fès.

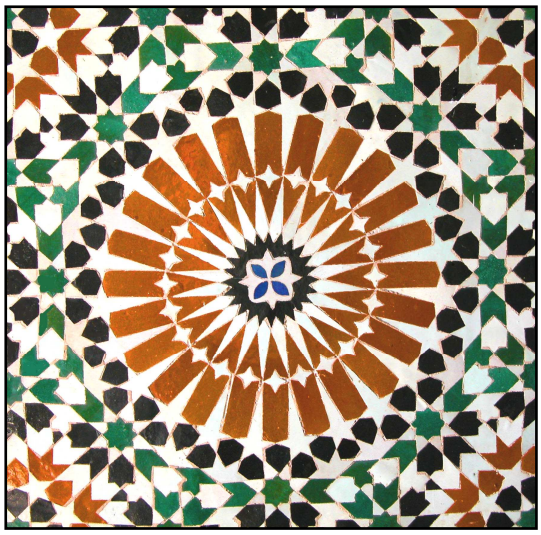


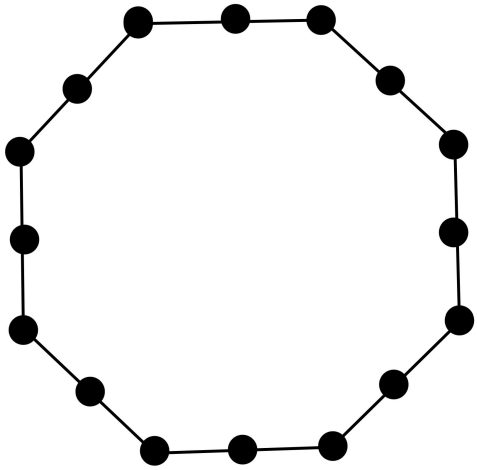
- Relevé des squelettes rencontrés :

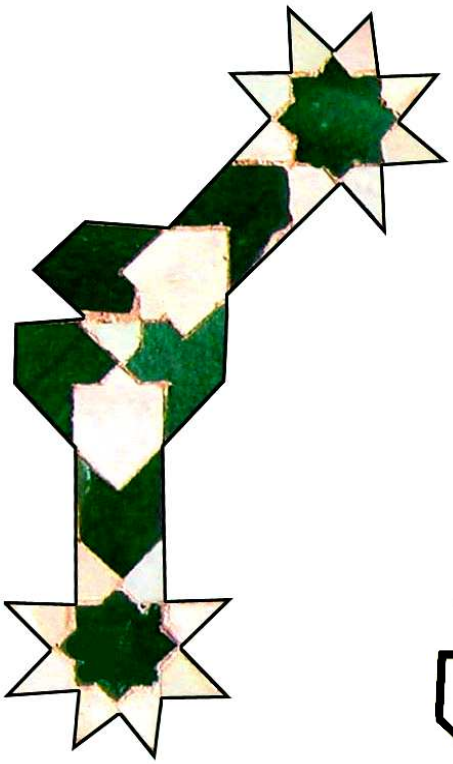


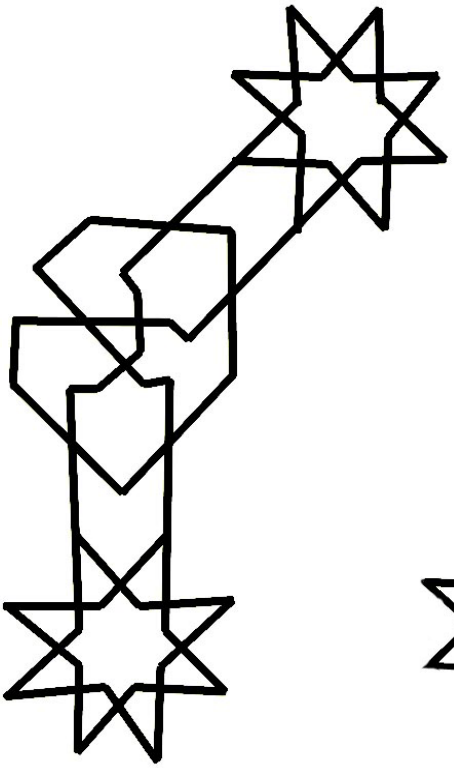
- Squelettes cachés :

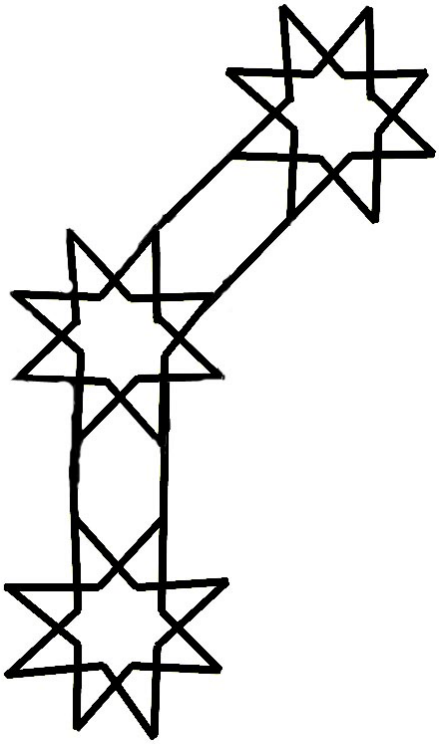




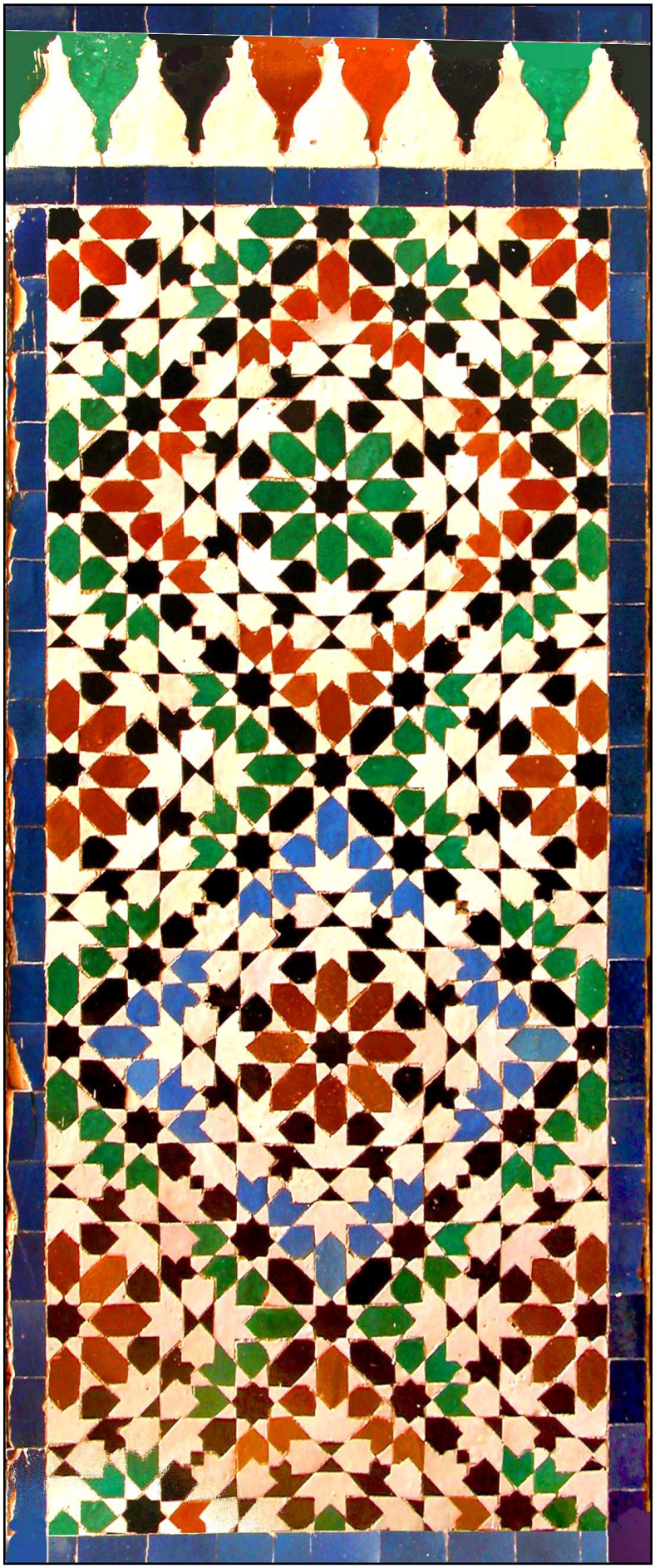




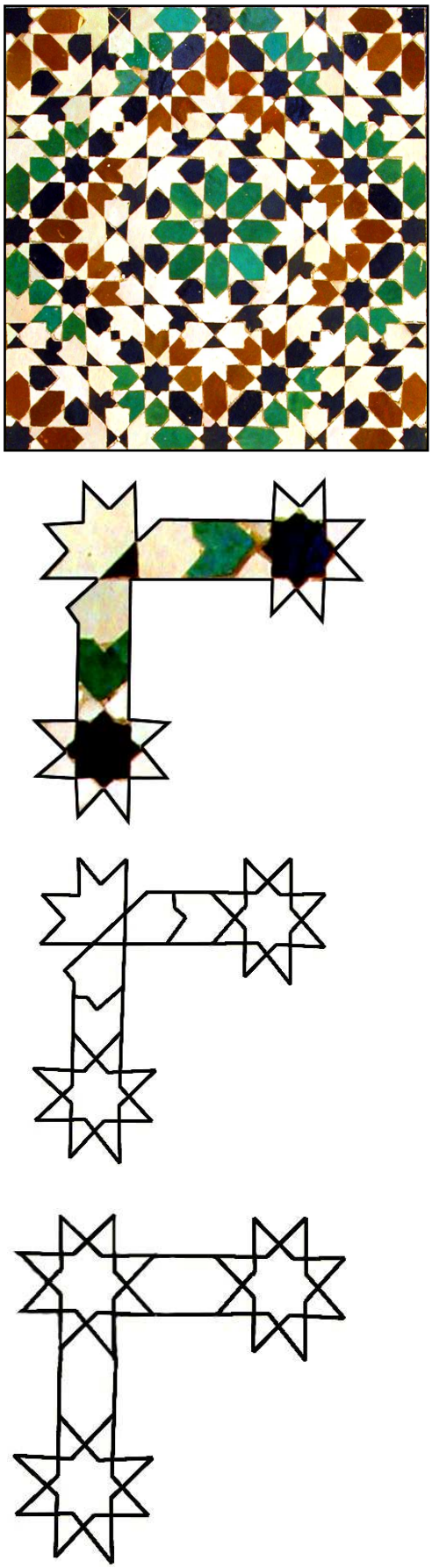




Pour briser les successions monotones de safts et de sceaux, le squelette en octogone double a été transformé et un sceau a été supprimé.



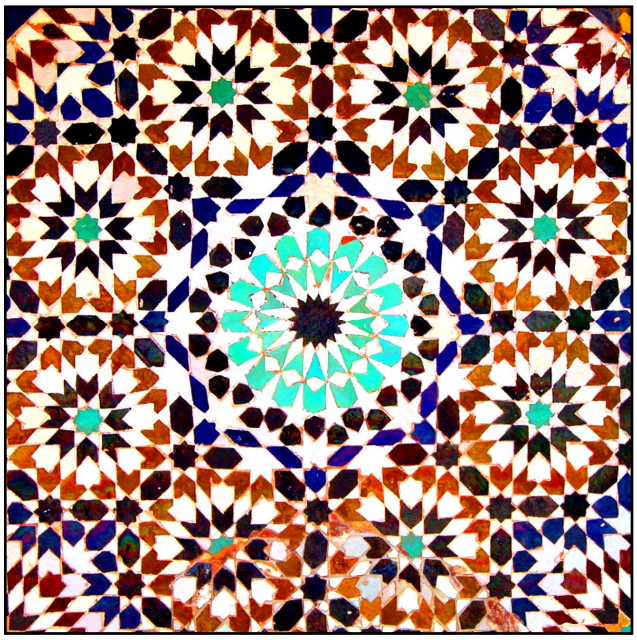
Mausolée de Moulay Ismaïl, Mekhnès.

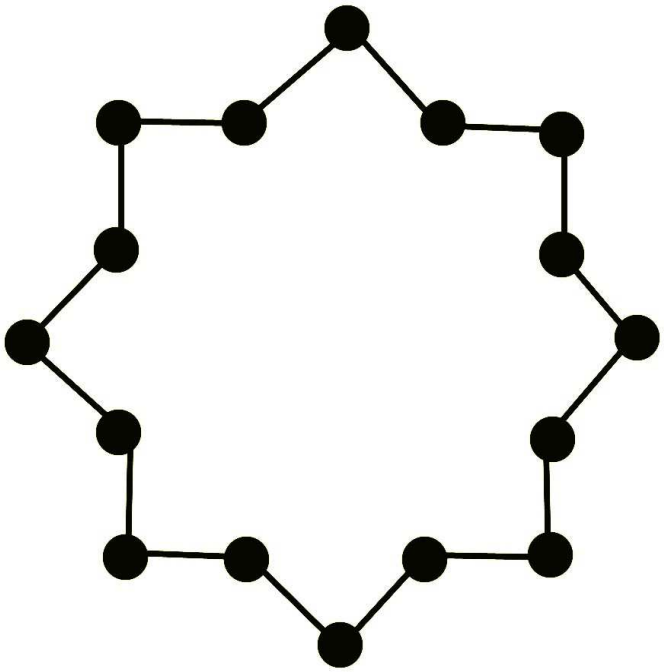


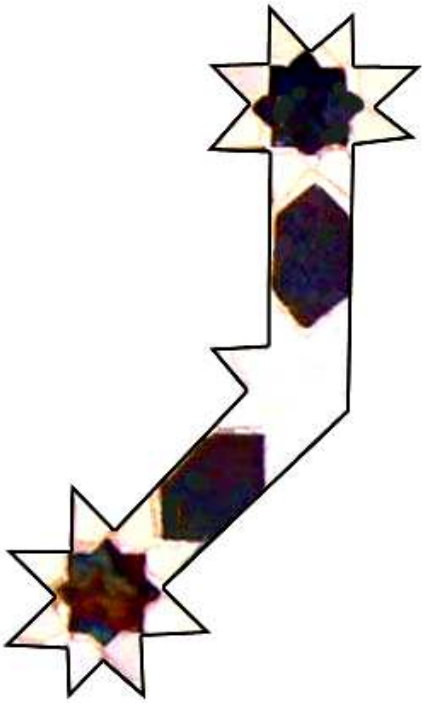
C’est un octogone étoilé qui est caché par le même artifice.

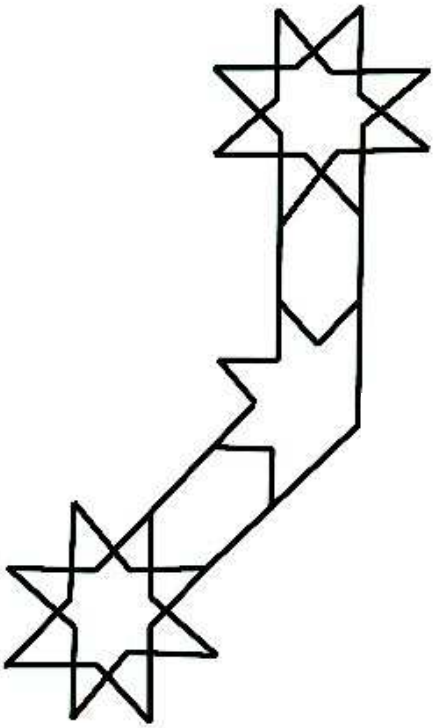


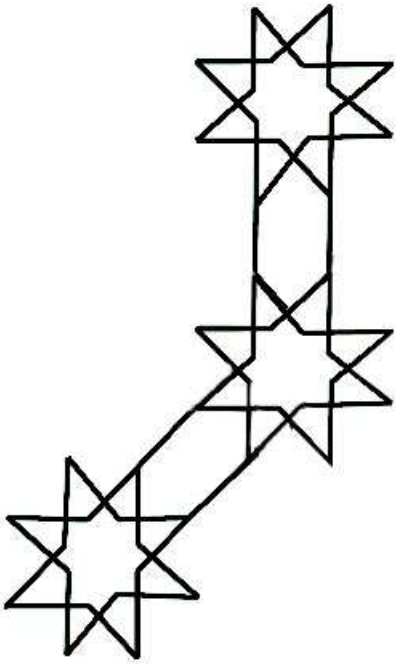
Fontaine du musée des Oudayas à Rabat.





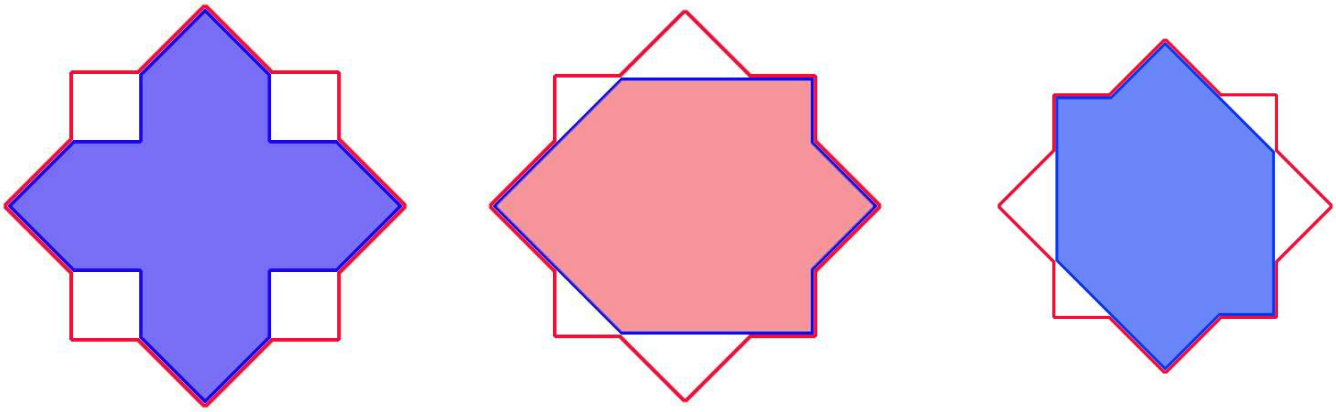






- *Pièces fondamentales :*

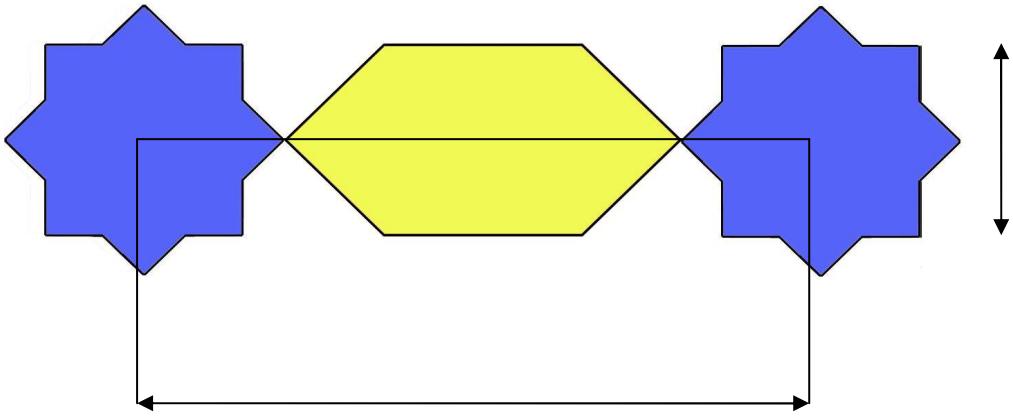
Toutes les pièces du répertoire classique sont issues du sceau.



Les dimensions des pièces sont donc bien précises ; cela permet des assemblages parfaits et de grande variété pour des compositions géométriques construites avec un nombre limité de pièces.

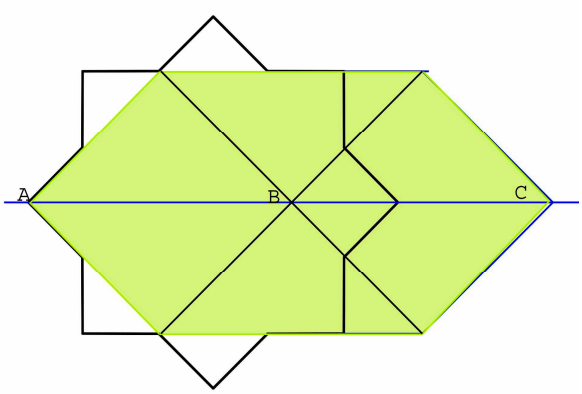
L'observation des différents squelettes permet de remarquer que les deux dimensions fondamentales (la largeur de bande **e** et la longueur de maille **m)** sont toutes deux liées par une relation fondamentale.

- *Relation :*



e = bande

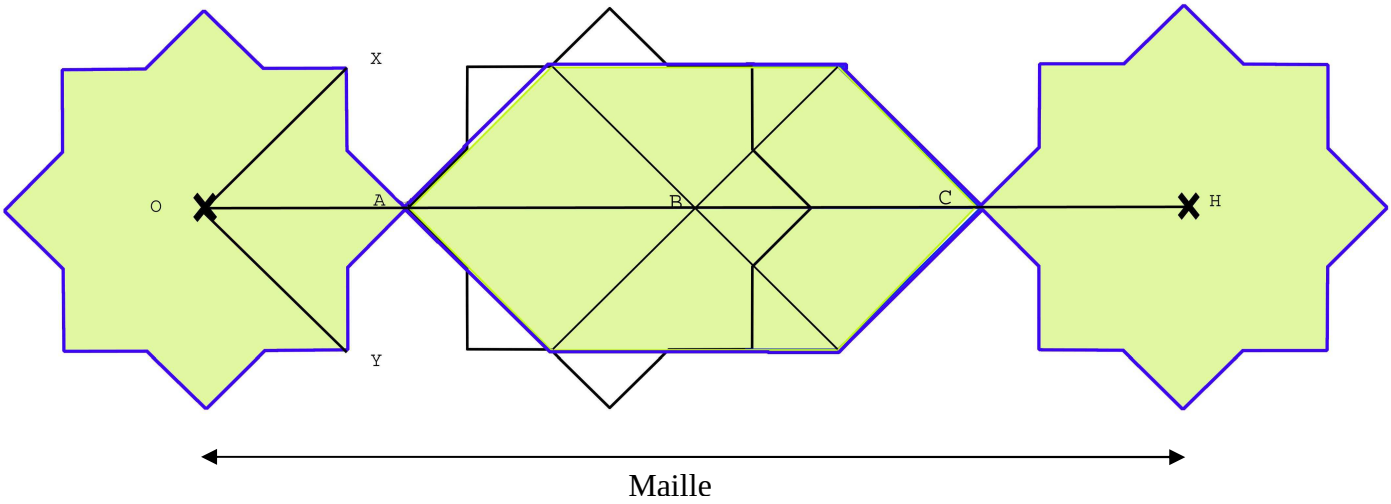
m = maille



Le saft est lui aussi issu du sceau et, par construction:

AB = BC = **e**

Donc : AC = 2 **e**



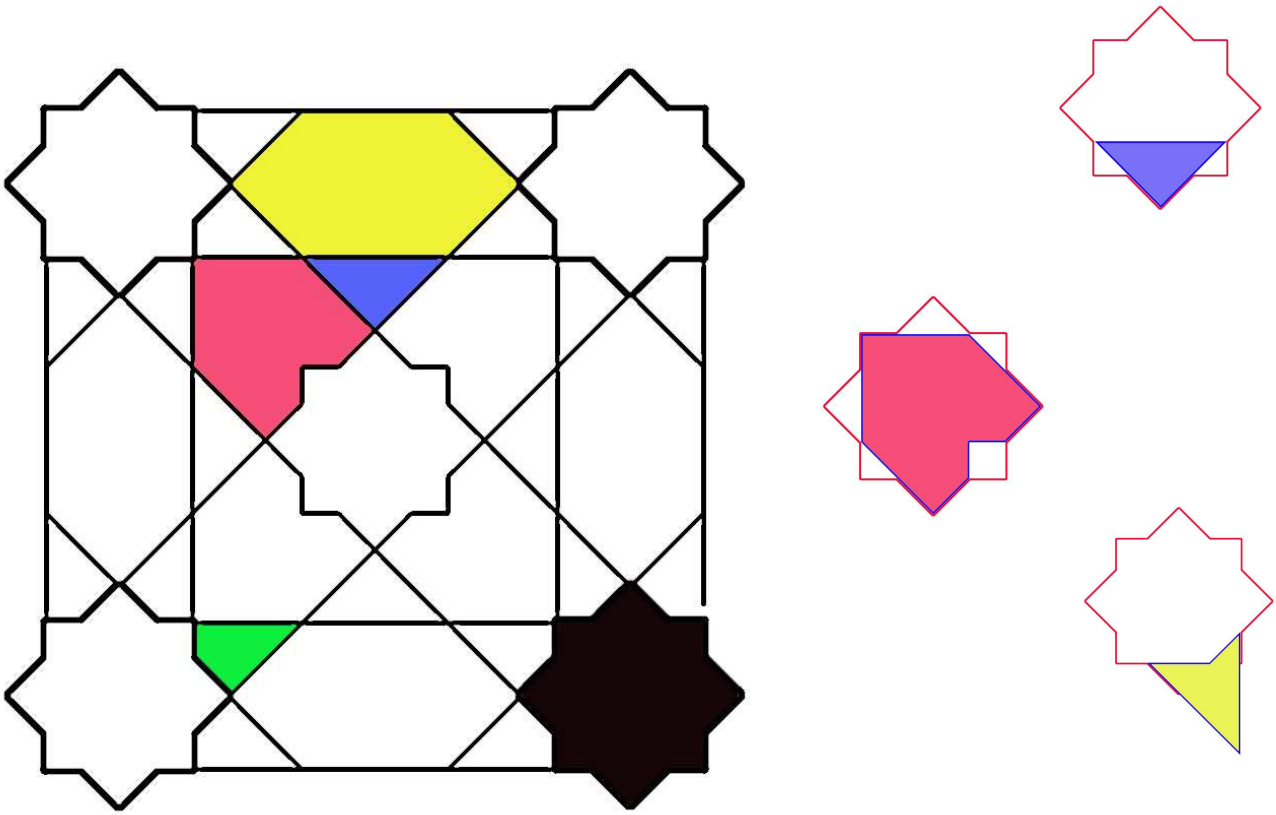
Un calcul simple permet de démontrer que :

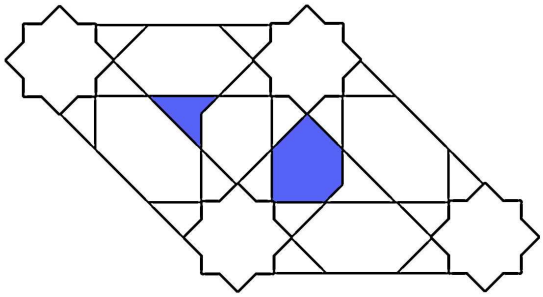
m = **e . 3,4** ou **e** = **m . 0,3**

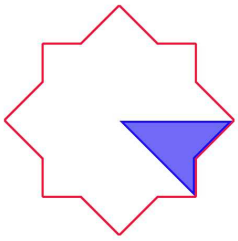
Cette valeur approximative au centième près, sera utilisée pour les constructions futures.

- *Découverte de quelques pièces :*

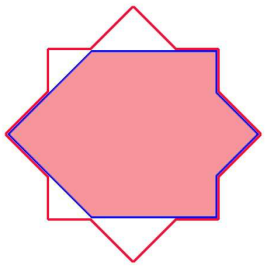
Dans le carré simple.

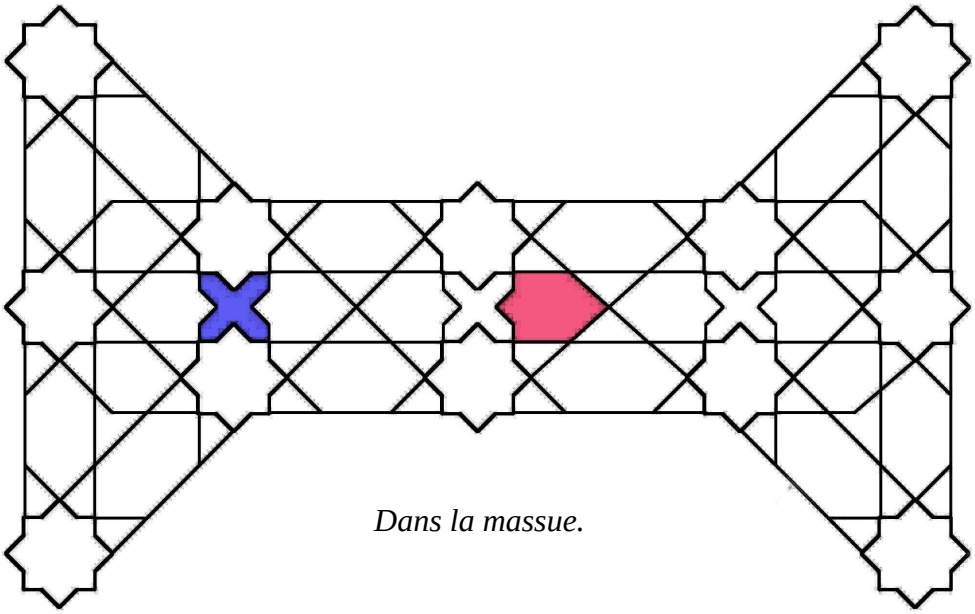


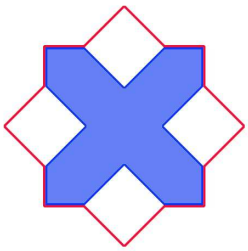




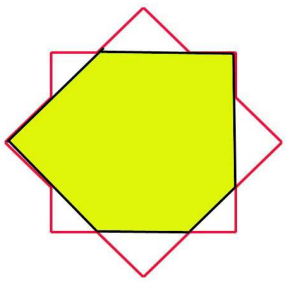
Dans le losange simple.

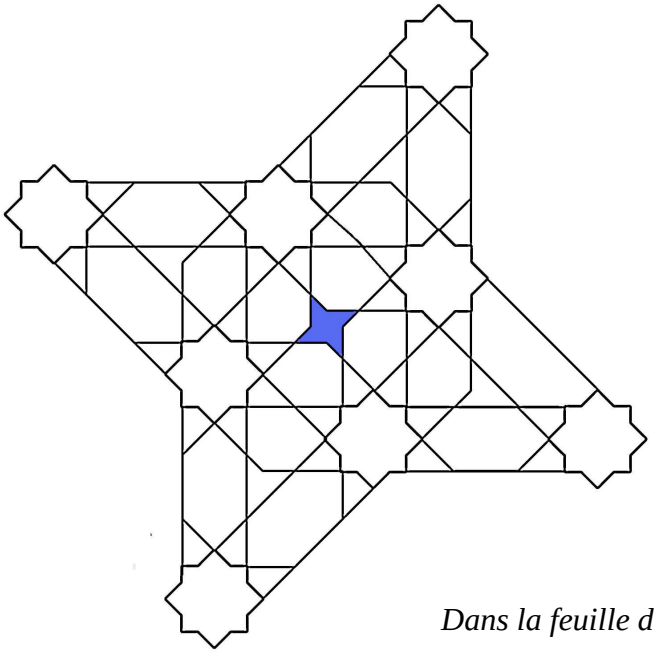


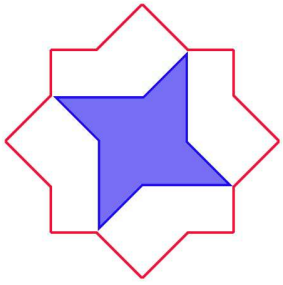




Dans la massue.







Dans la feuille de nacre.

