



What are the secrets of the Islamic master craftsmen?

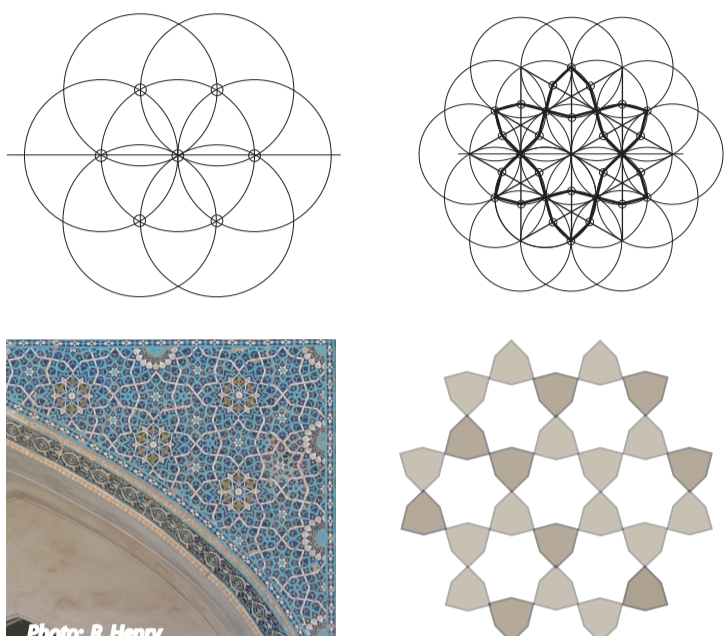
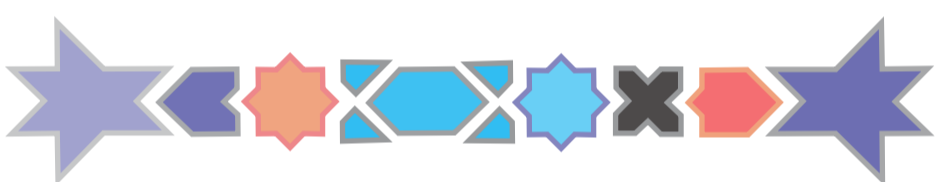


Photo: R. Henry

The use of geometry creates a natural harmony within Islamic art. This relates to the Islamic belief that all creation is harmoniously interrelated. The pattern above (15th century) from Yazd in Iran is derived from regular divisions of the circle. A regular grid of triangles is established, on top of which the design is elaborated.



A family of *zillij* shapes, derived from the octagram (*khatam* - 8 pointed star). These are typical of the ceramic cut tile pieces used in mosaics throughout Andalusia and Morocco from the early medieval period onwards.

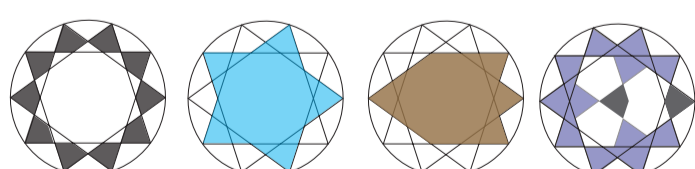


In the Alhambra (14th C), Spain (above), geometric pattern is perfectly integrated with biomorphic design (arabesque) and calligraphy. These decorative elements are deployed using a range of symmetries that have now been classified as belonging to distinct mathematical groups.

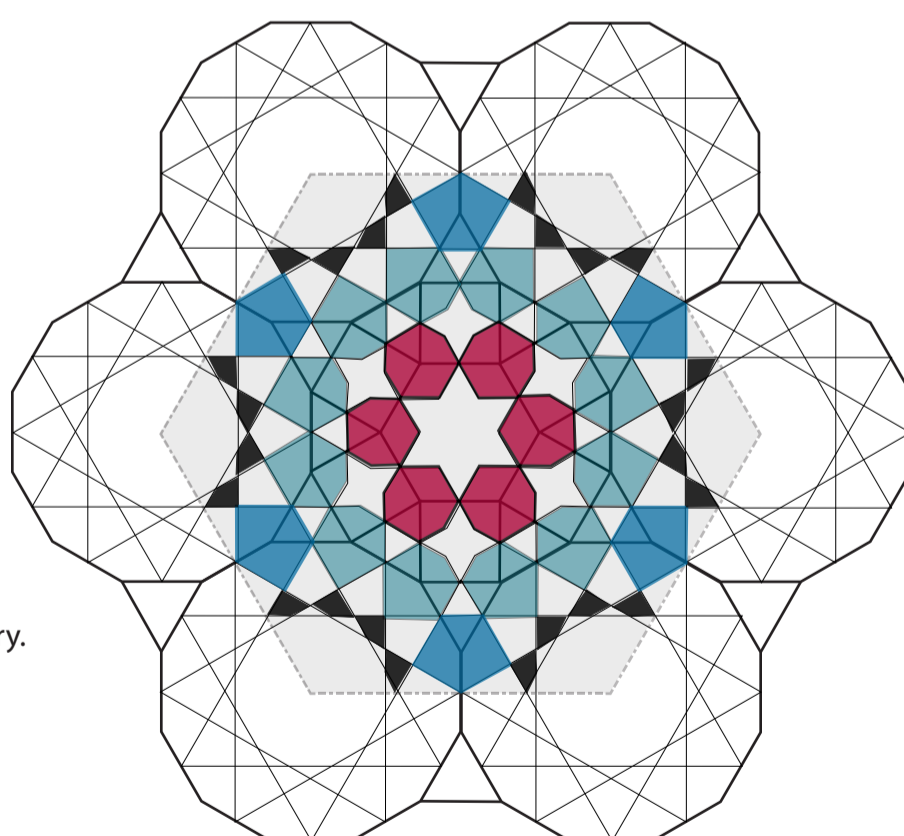


Photo: R. Henry

With a compass and ruler an Iranian master craftsman demonstrates a method for setting out a pattern which employs 10-fold radial symmetry. Note the construction of the decagram (10-pointed star).



Four examples of how to derive classic motifs from the decagram. These form the basis of 12th century Iranian *girih* patterns, which have been linked to Penrose's famous tilings.



Islamic designers used the full range of Archimedean tilings to explore pattern development. The pattern above is based on elements of medieval designs typically found in Cairo. Can you understand the underlying structure?

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