

Tiling from the Alhambra



Motion in geometry was used by the first African and Asian artists who repeated a pattern on a rock painting or piece of pottery. The curved-tile tessellation from the Alhambra that you will construct uses rotation to repeat the pattern.

Curved-tile tessellations start with a polygon. One or more curved areas are cut out of one side and attached to the opposite side of the polygon. Below are instructions for copying a pattern from the Alhambra that is based on the equilateral triangle.

Project: Make a Moorish tessellation with curved tiles. Check off each step as you complete it.

MATERIALS

- equilateral-triangle grid,
paper, paste, scissors
- 1. Paste an equilateral triangle grid on card stock. Then outline a triangle with sides that are eight units long at the center of the equilateral triangle grid. Draw the three medians. See Figure 1.
 - 2. Draw a small equilateral triangle, with sides that are two units long, around the intersection of the medians. Lightly pencil in the squares on the sides of this triangle. See Figure 2.
 - 3. Draw a six-point star, using these squares as guides. See Figure 3.
 - 4. With your compass, draw circular arcs to pass through points labeled A , B , C . If you wish, you can draw a freehand curve. See Figure 4.
- Note:* Moorish artists found the exact center of the circle that passes through points A , B , and C . The center was the point of intersection of the perpendicular bisectors of segments \overline{AB} and \overline{BC} .
- 5. Cut out the section between the arc ABC and the segment \overline{AC} . Use it as a template to add a curved section just below C . See Figure 5. Save the cutout to use as a template in the next step.

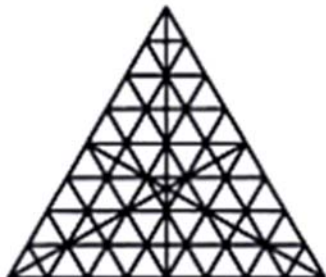


Figure 1



Figure 2



Figure 3

Tiling: Curved Pattern from the Alhambra (*continued*)

- 6. On the other two sides of the triangle, use the template to alternately remove and add curved sections as shown in Figure 6. Cut out the center star or make a separate star template. See Figure 7.
- 7. Paste your completed tile templates on a piece of poster board. Use Figure 8 as a guide for drawing around the templates to form tiles, then arranging the individual tiles to form a tessellation.

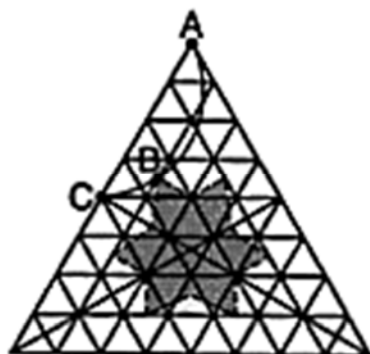


Figure 4

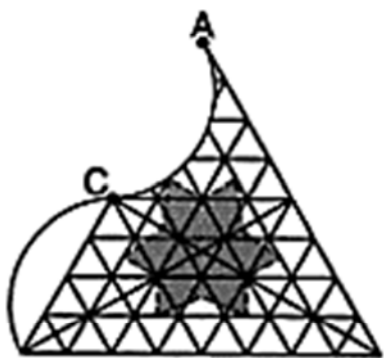


Figure 5

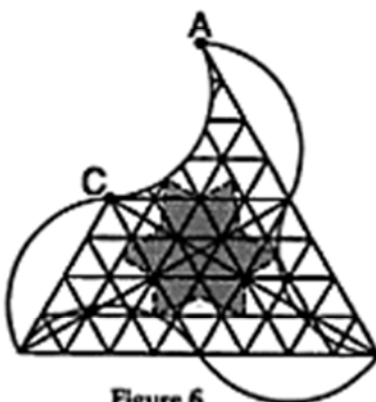


Figure 6

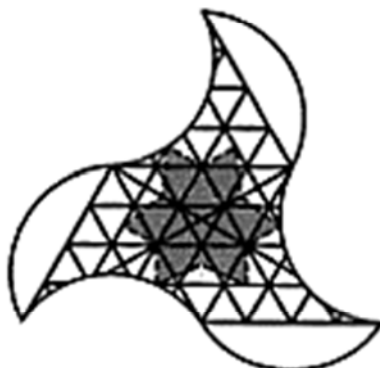


Figure 7



Figure 8

A curved-tile tessellation from the Alhambra after K. Critchlow, 1983