## Tessellations Worksheet

Sonia Kovalevsky Day at Mount Holyoke College<br>Saturday, November 10, 2018<br>Jennifer Li and Maggie Smith

1. Tessellate the plane with the regular hexagon.

2. If we can tessellate the plane with regular polygons of $n$ sides, then at each vertex, there will be a total of $q$ such polygons meeting. The numbers $n$ and $q$ must satisfy the equation

$$
\frac{1}{n}+\frac{1}{q}=\frac{1}{2}
$$

(a) In a square tiling of the plane, how many squares must meet at each vertex?
(b) In a regular hexagon tessellation of the plane, how many hexagons must meet at each vertex?
(c) In a regular pentagon tessellation of the plane, how many pentagons must meet at each vertex?
3. Draw the dual tessellation of the given tessellation. What do you notice about these duals?



4. For each tile below, create a monohedral tessellation of the plane:
(a)

(b)

(c)

5. Of the twenty-four heptiamonds shown below, find the one which cannot be used to tile the plane monohedrally. Challenge: Find a tessellation for the other twenty-three (there might be more than one possible tiling)!

6. In each Archimedean tessellation, a vertex is marked in red. Describe the tiles around the marked vertex. What do you think the label under each tiling means?

$3^{2} .4 .3 .4$

4. $8^{2}$

$3^{4} .6$

