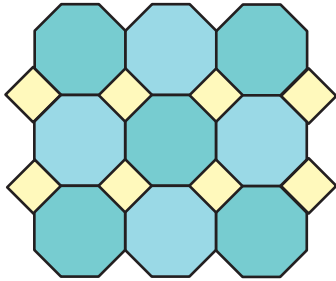


Tessellations with semi-regular polygonal regions

Using the polygon cluster in the Mathomat V7 template you can investigate "semi-regular" tessellations. These use a combination of regular polygons. The sum of the angles at any point in a tessellation is 360 degrees. There are only 8 possible semi-regular tessellations, they are shown below:

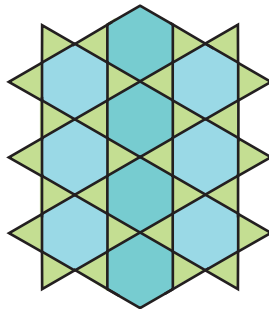
semi-regular tessellations

octagons and squares



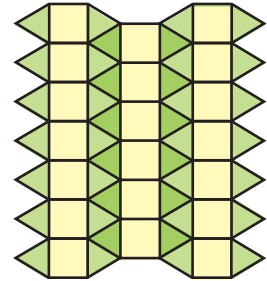
Using shapes 6 and 25 (large)
or 3 and 14 (small)

hexagons and triangles



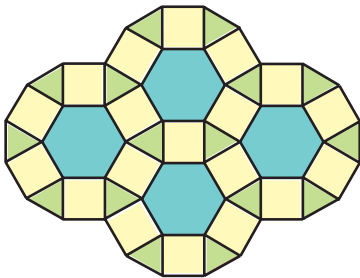
Shapes 7 and 5 (large)
or 4 & 16 (small)

squares and triangles



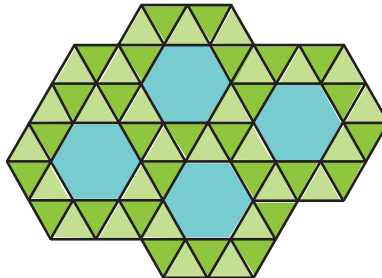
Shapes 22 and 5 (large)
or 14 and 16 (small)

hexagons, squares and triangles



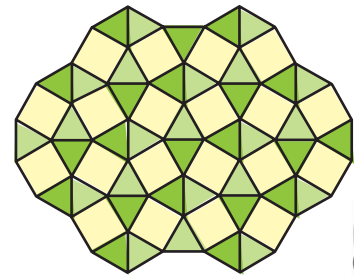
Shapes 16, 22 and 5 (large)
4, 14 and 16 (small)

hexagons and triangles



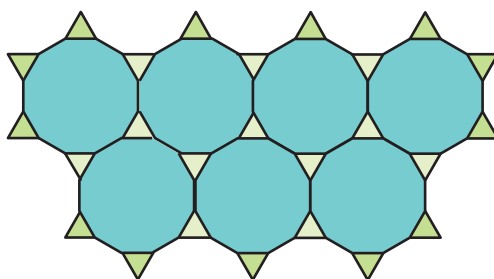
Shapes 7 and 5 (large)
or 4 and 16 (small)

squares and triangles



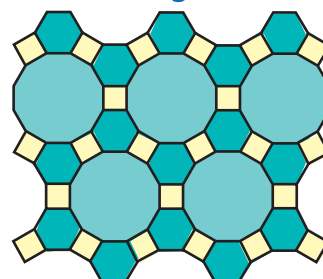
Shapes 22 and 5 (large)
or 14 & 16 (small)

Dodecagons and triangles



Using shapes 2 and 16

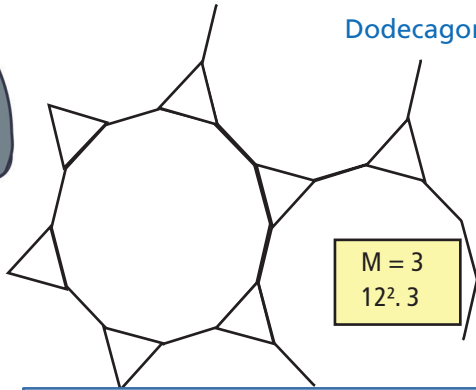
Dodecagons, squares and hexagons



Using shapes 2, 4 and 14

Because the vertex in each pattern is the same these 8 patterns are sometimes called the 'homogeneous' tessellations. We can describe them very effectively using numbering that shows the number of regular polygons meeting at each vertex, and the order in which they are arranged.

Coding the semi-regular tessellations



Dodecagons and triangles

M stands for the number of regular polygons at each vertex.
 $12^2.3$ or $12.12.3$ is the order in which each regular polygon appears.

Draw the remaining 7 semi-regular tessellations in the spaces provided using the Mathomat V7 template and write the correct vertex coding into the answer boxes.

Dodecagons, hexagons and squares		Octagons and squares	
		M =	
M =		Squares and triangles	
		M =	M =
Hexagons and triangles	Hexagons with triangles and squares		Triangles and squares
M =	M =	M =	
Hexagons and triangles			
M =	<p>If you were texting a friend you could explain a pattern exactly by its vertex coding.</p> <p style="text-align: right;"><small>Friday 19.58</small></p> <div style="border: 1px solid green; padding: 5px; display: inline-block; background-color: #e0ffe0;"> My pattern uses octagons and squares (shapes 3 and 16) and the vertex code is $M = 3 \quad 8^2.4$ </div> <p style="text-align: right;"><small>Read Friday</small></p> <p style="text-align: left;"><small>Friday 20.08</small></p> <div style="border: 1px solid gray; padding: 5px; display: inline-block; background-color: #d0d0d0;"> Thanks, I'll try drawing it with my Mathomat. :) </div>		