

Symmetries of the plane

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An implementation of all 17 plane symmetries in TikZ. With the orbifold signature these are the following:

*632	*442	*333	*2222	**
			2*22	*×
	4*2	3*3	22*	
			22×	×
632	442	333	2222	○

For their meaning and more pretty pictures see “*The Symmetries of Things*” by John H. Conway, Heidi Burgiel and Chaim Goodman-Strauss.

A brief comment about the orbifold signature: A number n before $*$ represent a **gyration point** of order n , thus in 632 we have three effectively distinct points with respective orders 6, 3 and 2. Each $*$ represent a kaleidoscope, a kaleidoscope which is not followed by a number is a mirror, a following number n represent a point where n **mirror lines** cross. Thus, in $*333$ we have a kaleidoscope with 3 different points, in each one, there are crossing 3 mirrors. In $4*2$ we have a gyration point of order 4, the four neighbour point are actually the same point, a point where 2 mirrors cross. The \times is called a **miracle** and represent a reflection which cannot be explained by a mirror line. Finally, the \circ is called a **wonder** and represents translations which are not explained by any previous symbol.



























