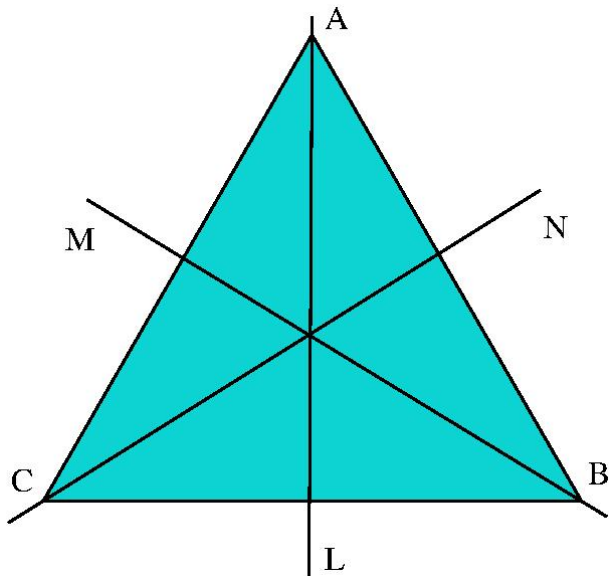
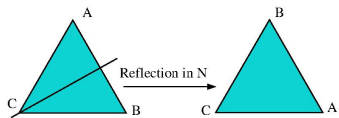
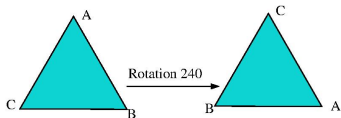
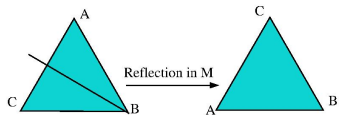
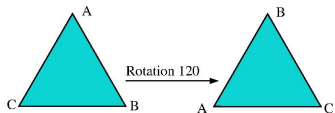
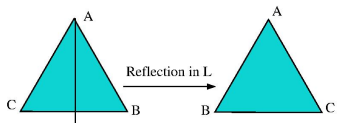
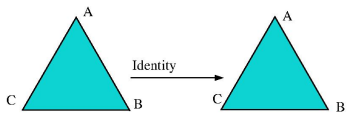


The group of symmetries of the equilateral triangle



Symmetries of the triangle

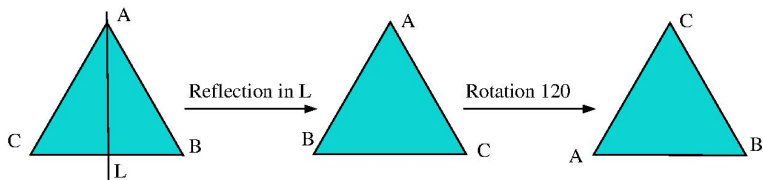


The Group Operation in D_6

The group D_6 of symmetries of the triangle has six elements.

$$D_6 = \{\text{id}, R_{120}, R_{240}, T_L, T_M, T_N\}.$$

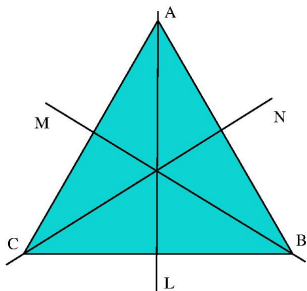
The group operation is composition, denoted by the symbol \circ . $R_{120} \circ T_L$ means “ R_{120} after T_L ”, the symmetry obtained by applying T_L first and then R_{120} . We can figure out which one it is by watching what happens to the vertices in this composition of symmetries.



Comparing the final position to the starting position, we see that

$$R_{120} \circ T_L = T_M.$$

Group table for D_6



\circ	id	R_{120}	R_{240}	T_L	T_M	T_N
id	id	R_{120}	R_{240}	T_L	T_M	T_N
R_{120}	R_{120}	R_{240}	id	T_M	T_N	T_L
R_{240}	R_{240}	id	R_{120}	T_N	T_L	T_M
T_L	T_L	T_N	T_M	id	R_{240}	R_{120}
T_M	T_M	T_L	T_N	R_{120}	id	R_{240}
T_N	T_N	T_M	T_L	R_{240}	R_{120}	id

In general, the group of symmetries of the regular n -gon is denoted D_{2n} and called the **dihedral group of order $2n$** . It has $2n$ elements, n rotations (including the identity) and n reflections.