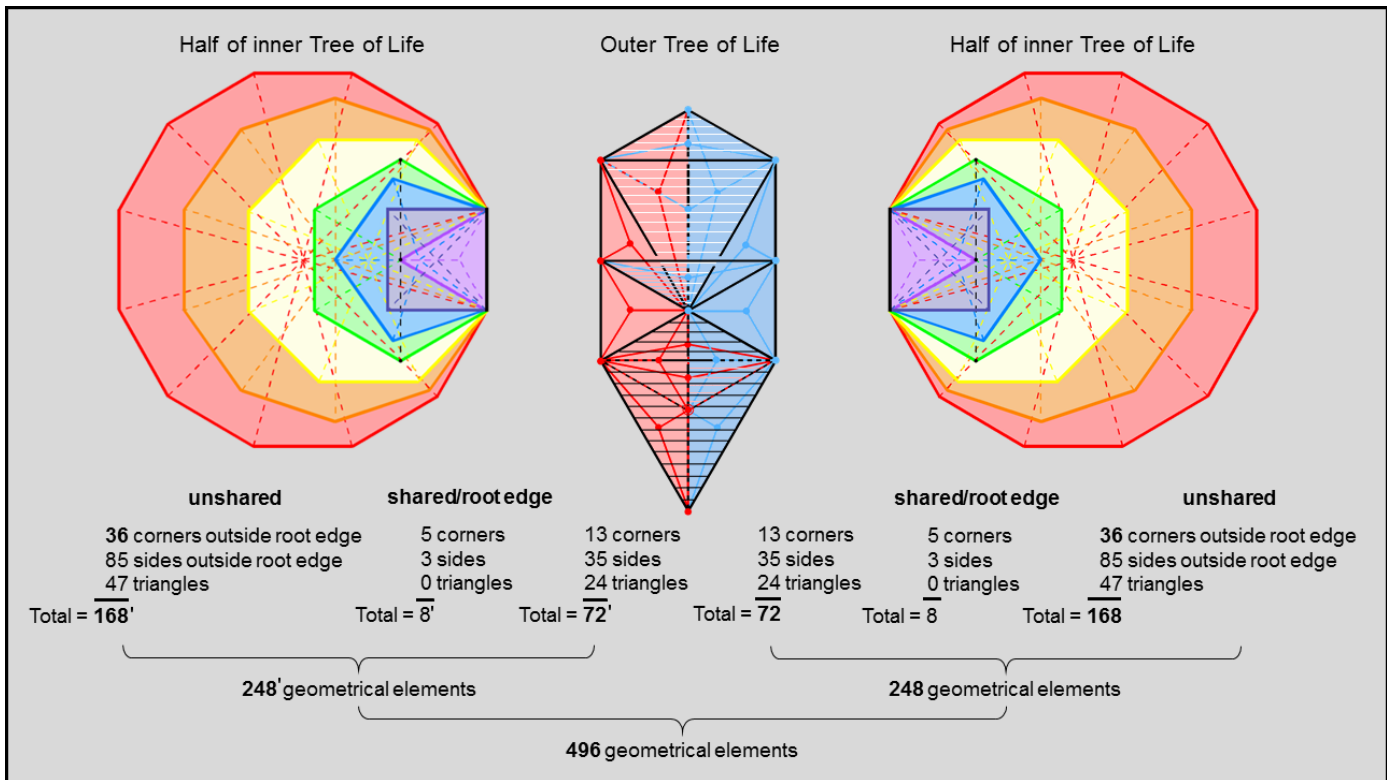


Correspondence between the 496 roots of $E_8 \times E_8'$ and the geometrical composition of the separate outer & inner Trees of Life



The outer Tree of Life is composed of 16 triangles with 10 corners and 22 sides. When they are Type A, they have $(16 \times 3 = 48)$ sectors with $(10 + 16 = 26)$ corners and $(22 + 16 \times 3 = 70)$ sides. These 144 geometrical elements comprise those distributed on either side of the central Pillar of Equilibrium as pairs of elements that are mirror images of each other (red/blue) and those either located on this Pillar or spanning both sides of it in a symmetrical way; the latter can be divided into two equal sets that can be formally associated with either half of the outer Tree of Life. The 3 triangles spanning both halves that are shaded with white horizontal lines are associated with the right half and with the right-hand set of polygons; the 3 triangles shaded with black horizontal lines are associated with the left half of the outer Tree of Life and with the left-hand set of polygons. This means that $(144/2 = 72)$ geometrical elements are associated with each half. Those associated with the left-hand set of 7 polygons are written as **72'**. The 7 enfolded polygons making up each half of the inner Tree of Life are composed of 47 triangles with 41 corners and 88 sides. These 176 geometrical elements comprise the three geometrical elements (two corners & one side) making up their shared root edge, the top, centre & bottom corner of the hexagon, the two vertical, internal sides of its sectors and **168** other geometrical elements. The hexagon in each set of polygons has 5 geometrical elements (3 black corners and 2 black dashed sides) that coincide with their counterparts in the outer Tree when it combines with its inner form. The set of 5 *shared* elements in the left-hand set of polygons is written as **5'** and the 3 elements making up their root edge are written as **3'**; their unshared elements outside the root edge are written as **168'**. Hence,

$$\begin{aligned}
 144 &= 72' + 72, \\
 176' &= 3' + 5' + 168', \\
 176 &= 3 + 5 + 168.
 \end{aligned}$$

The total number of geometrical elements in the separate outer and inner Trees with Type A polygons = $176' + 144 + 176 = 496$

$$\begin{aligned}
 &= (3' + 5') + 72' + 168' + (3 + 5) + 72 + 168 \\
 &= 8' + 72' + 168' + 8 + 72 + 168 = 248' + 248,
 \end{aligned}$$

where $8' = 3' + 5'$, $8 = 3 + 5$, $248 = 8 + 72 + 168$ and $248' = 8' + 72' + 168'$. The 8 geometrical elements in the right-hand set of polygons that either belong to the root edge or are shared with the outer Tree of Life correspond to the 8 simple roots of E_8 ; their 8 counterparts in the left-hand set (written as $8'$) correspond to the 8 simple roots of an identical group (written as E_8'). The **72** geometrical elements associated with either half of the outer Tree of Life correspond to the **72** roots of E_6 , the rank-6, exceptional subgroup of E_8 . The remaining unshared **168** elements in each set of polygons correspond to the **168** roots of E_8 that are not roots of E_6 . The *direct product* $E_8 \times E_8'$ appearing in string theory as the symmetry group describing the anomaly-free, unified interactions of one of the two types of heterotic superstrings arises from the left-right *mirror symmetry* of both the outer and inner forms of the Tree of Life. This natural isomorphism between the root composition of $E_8 \times E_8'$ and the geometrical composition of the Tree of Life can have no other plausible explanation than that *$E_8 \times E_8'$ heterotic superstrings exist as the subatomic manifestation of the universal blueprint known as the "Tree of Life."*