

	\mathbb{R}	\mathbb{C}	\mathbb{H}	\mathbb{O}
\mathbb{R}'	$\mathfrak{so}(2)$	$\mathfrak{so}(3)$	$\mathfrak{so}(5)$	$\mathfrak{so}(9)$
\mathbb{C}'	$\mathfrak{so}(2, 1)$	$\mathfrak{so}(3, 1)$	$\mathfrak{so}(5, 1)$	$\mathfrak{so}(9, 1)$
\mathbb{H}'	$\mathfrak{so}(3, 2)$	$\mathfrak{so}(4, 2)$	$\mathfrak{so}(6, 2)$	$\mathfrak{so}(10, 2)$
\mathbb{O}'	$\mathfrak{so}(5, 4)$	$\mathfrak{so}(6, 4)$	$\mathfrak{so}(8, 4)$	$\mathfrak{so}(12, 4)$

Table 1: The “half-split” 2×2 magic square of Lie algebras.

	\mathbb{R}	\mathbb{C}	\mathbb{H}	\mathbb{O}
\mathbb{R}'	$1 + 0 + 0 = 1$	$2 + 1 + 0 = 3$	$4 + 3 + 3 = 10$	$8 + 7 + 21 = 36$
\mathbb{C}'	$2 + 1 + 0 = 3$	$4 + 2 + 0 = 6$	$8 + 4 + 3 = 15$	$16 + 8 + 21 = 45$
\mathbb{H}'	$4 + 3 + 3 = 10$	$8 + 4 + 3 = 15$	$16 + 6 + 6 = 28$	$32 + 10 + 24 = 66$
\mathbb{O}'	$8 + 7 + 21 = 36$	$16 + 8 + 21 = 45$	$32 + 10 + 24 = 66$	$64 + 14 + 42 = 120$

Table 2: Counting the “half-split” 2×2 magic.

	\mathbb{R}	\mathbb{C}	\mathbb{H}	\mathbb{O}
\mathbb{R}'	$\mathfrak{so}(3)$	$\mathfrak{su}(3)$	$\mathfrak{sp}(3)$	\mathfrak{f}_4
\mathbb{C}'	$\mathfrak{sl}(3, \mathbb{R})$	$\mathfrak{sl}(3, \mathbb{C})$	$\mathfrak{a}_{5(-7)}$	$\mathfrak{e}_{6(-26)}$
\mathbb{H}'	$\mathfrak{sp}(6, \mathbb{R})$	$\mathfrak{su}(3, 3)$	$\mathfrak{d}_{6(-6)}$	$\mathfrak{e}_{7(-25)}$
\mathbb{O}'	$\mathfrak{f}_{4(4)}$	$\mathfrak{e}_{6(2)}$	$\mathfrak{e}_{7(-5)}$	$\mathfrak{e}_{8(-24)}$

Table 3: The “half-split” 3×3 magic square of Lie algebras.

	\mathbb{R}	\mathbb{C}	\mathbb{H}	\mathbb{O}
\mathbb{R}'	$3 + 0 + 0 = 3$	$6 + 2 + 0 = 8$	$12 + 6 + 3 = 21$	$24 + 14 + 14 = 52$
\mathbb{C}'	$6 + 2 + 0 = 8$	$12 + 4 + 0 = 16$	$24 + 8 + 3 = 35$	$48 + 16 + 14 = 78$
\mathbb{H}'	$12 + 6 + 3 = 21$	$24 + 8 + 3 = 35$	$48 + 12 + 6 = 66$	$96 + 20 + 17 = 133$
\mathbb{O}'	$24 + 14 + 14 = 52$	$48 + 16 + 14 = 78$	$96 + 10 + 17 = 133$	$192 + 28 + 28 = 248$

Table 4: Counting the “half-split” 3×3 magic.

	\mathbb{R}	\mathbb{C}	\mathbb{H}	\mathbb{O}
\mathbb{R}'	$3 \times 1 - 0 = 3$	$3 \times 3 - 1 = 8$	$3 \times 10 - 9 = 21$	$3 \times 36 - 56 = 52$
\mathbb{C}'	$3 \times 3 - 1 = 8$	$3 \times 6 - 2 = 16$	$3 \times 15 - 10 = 35$	$3 \times 45 - 57 = 78$
\mathbb{H}'	$3 \times 10 - 9 = 21$	$3 \times 15 - 10 = 35$	$3 \times 28 - 18 = 66$	$3 \times 66 - 65 = 133$
\mathbb{O}'	$3 \times 36 - 56 = 52$	$3 \times 45 - 57 = 78$	$3 \times 66 - 65 = 133$	$3 \times 120 - 112 = 248$

Table 5: Using the 2×2 magic square to count the 3×3 magic square.