Procedure to produce some self-complementary graphs

**Step 1:** Let $H$ be any graph which is self-complementary, and let $P_4 = v_1v_2v_3v_4$ be a 4-path, i.e., a path with exactly four vertices.

**Step 2:** Join each of $v_2$ and $v_3$ to all vertices of $H$. We call this operation a *4-path addition*.

The resulting graph with $v(H) + 4$ vertices can easily be checked to be self-complementary. Thus, for each $n = 4k$, or $4k+1$, we can inductively construct self-complementary graphs with precisely $n$ vertices.

**Example:**

Let $H$ be $C_5$. After the 4-path addition operation, we get a self-complementary graph of 9 vertices.