A covering projection from graph G onto graph H is ”local isomorphism”: a mapping from the vertex set of G onto the vertex set of H such that, for every v V (G), the neighborhood of v is mapped bijectively onto the neighborhood (in H) of the image of v. We study the computational complexity of the H-cover (deciding if a given graph G covers H), where G is a regular graph with 8 vertices and edges of two colors, where edges of one color create two disjoint 4-cycles. We present full characterization of H-cover problem for such 3-regular graphs. We solve polynomial cases by reduction to system of linear equations and we show some graphs for which this method doesn’t work (even though H-cover is polynomial).