1176-05-223 **Thomas Tucker Tucker*** (ttucker@colgate.edu), **Wilfried Imrich**, **Thomas Lachman** and **Gundelinde Wiegel**. *Cost of distinguishing vertex-transitive cubic graphs.*

A graph Γ is *2-distinguishable* if its vertices can be colored black or white so that only the identity automorphism preserves the coloring: the minimum number of vertices colored black is the *cost* $\rho(\Gamma)$ and the ratio $\rho(G)/|V(G)|$ (or its limit on increasing balls for infinite Γ) is the *density* $\delta(\Gamma)$. Our interest is graphs of valence 3 (cubic), both finite and infinite. For cubic graphs that are not vertex-transitive, we construct infinite examples achieving the obvious upper bound $\delta = 1/2$ and finite examples with δ arbitrarily near 1/2. Thus we focus on vertex-transitive graphs. If Γ has three arc-orbits, $Aut(\Gamma)$ is fixed point free so $\rho(\Gamma) = 1$. For one arc-orbit (arc-transitive), we show $\rho(\Gamma) \leq 5$ using Tutte's theory of s-arc regular cubic graphs. For two arc-orbits, the girth of Γ (shortest simple cycle) plays a key role. For girth three, the cost is at most 3 using truncation of arc-transitive cubic graphs. For girth four, the infinite crossed ladder has $\delta = 1/4$, as do its finite cyclic quotients (möbius ladders). The situation for girth 5 or more is not at all clear. (Received January 24, 2022)