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DP-coloring of planar graphs without 4-, 9-cycles and two cycles from $\{5, 6, 7, 8\}$.

A generalization of list-coloring, now known as DP-coloring, was recently introduced by Dvořák and Postle. In list coloring, adjacent vertices cannot receive identical colors. In the assignment for a DP-coloring, this restriction is replaced by a restriction given by an arbitrary matching between the lists of available colors. Although list-coloring results do not always extend to DP-coloring results, several results on list-coloring of planar graphs have been extended to the setting of DP-coloring. We prove that if $\{a, b\}$ is one of $\{5, 6\}$, $\{5, 7\}$, $\{6, 7\}$, $\{6, 8\}$, or $\{7, 8\}$, then every planar graph without cycles of lengths $\{4, a, b, 9\}$ is DP-3-colorable. (Received September 24, 2018)