

The 2-dimension of a Tree

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Let x and y be two distinct vertices in a connected graph G . The x, y -location of a vertex w is the ordered pair of distances from w to x and y , that is, the ordered pair $(d(x, w), d(y, w))$. A set of vertices W in G is x, y -located if any two vertices in W have distinct x, y -location. A set W of vertices in G is 2-located if it is x, y -located, for some distinct vertices x and y . The 2-dimension of G is the order of a largest set that is 2-located in G . Note that this notion is related to the metric dimension of a graph, but not identical to it. We study in depth the trees T that have a 2-locating set, that is, have 2-dimension equal to the order of T . Using these results, we have a nice characterization of the 2-dimension of arbitrary trees.

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