

1086-20-2559

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Thompson's groups F and T were introduced by Richard Thompson in the 1960's in connection with questions in logic. They have since found applications in many areas of mathematics including algebra, logic and topology. For F it is known how to calculate the word metric with respect to the so-called "consecutive" generating sets X_n , which has allowed researchers to analyze its metric properties such as almost convexity and dead ends with respect to these generating sets. For T , there is no generating set for which an algorithm is known for determining the word metric so its metric properties are less well known. We develop tools for determining the length with respect to the generating set

$\{x_0, x_1, c$

$\}$ of elements whose diagram representations have a certain form, and we use these tools to determine the exact length of three infinite families of elements in T . (Received September 25, 2012)