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Abstract

For integers $g \geq 3$, $k \geq 2$, call a number N a (g, k) -reverse multiple if the reversal of N in base g is equal to k times N . The numbers 1089 and 2178 are the two smallest $(10, k)$ -reverse multiples, their reversals being $9801 = 9 \cdot 1089$ and $8712 = 4 \cdot 2178$. In 1992, A. L. Young introduced certain trees in order to study the problem of finding all (g, k) -reverse multiples. By using modified versions of her trees, which we call *Young graphs*, we determine the possible values of k for bases $g = 2$ through 100, and then show how to apply the transfer-matrix method to enumerate the (g, k) -reverse multiples with a given number of base- g digits. These Young graphs are interesting finite directed graphs, whose structure is not at all well understood.