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Nathan G McNew* (nmcnew@towson.edu), 8000 York Road, Towson, MD 21252. *Random multiplicative walks on the residues modulo n .*

Consider a multiplicative random walk on the set, $\mathbb{Z}/n\mathbb{Z}$, of residues modulo n , where at each step one chooses a residue uniformly at random, and multiplies the current state by it. This is an absorbing random walk with a single absorbing state, $0 \pmod{n}$. We are interested in the expected time to absorption, which we denote by $a(n)$. We give several ways to compute $a(n)$ and find that it is closely related to $P_1(n)$, the largest prime divisor of n . Both functions have the same average order asymptotically and the difference between the functions is $o(1)$ as n tends to infinity on a set with positive density. Finally we find that in an average sense, a better approximation for $a(n)$ is $a(n) \approx P_1(n) + \frac{\pi}{4}P_2(n)$ where $P_2(n)$ is the second largest divisor of n . (Received September 14, 2016)