

To solve POTW 9 I used the exhaustion method to see if the sequence reached 1. by noticing that all multiples of 3, starting from 3 to 24 reach 1, I assumed that 27 must also make the sequence return to 1. The following were the terms of the sequence:

27,82,41,124,62,31,94,47,142,71,214,107,322,161,44,242,121,364,182,91,274,137,412,206,103,310,155,466,233,700,350,175,526,263,790,395,1186,593,1780,890,445,1336,668,334,167,502,251,754,377,1132,566,283,850,425,1276,638,334167,502,251,754,377,1132,566,283,850,425,1276,638,319,958,479,1438,719,2158,1079,3238,1619,4858,2429,7288,3644,1822,911,2734,1367,4102,2051,6154,3077,9232,4616,2308,1154,577,1732,866,433,1300,650,325,976,488,244,122,61,184,92,46,23,70,35,106,53,160,80,40,20,10,5,16,8,4,2,1.

The sequence finally reaches 1 at the 112th term of the sequence.