

Question

Question ID: 885



15. A sequence of positive integers $t_1, t_2, t_3, t_4, \dots$ is defined by:
 $t_1 = 13$; $t_{n+1} = \frac{1}{2}t_n$ if t_n is even; $t_{n+1} = 3t_n + 1$ if t_n is odd.
 What is the value of t_{2008} ?
 A 1 B 2 C 4 D 8 E None of these.

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Answer

15. A The sequence proceeds as follows: 13, 40, 20, 10, 5, 16, 8, 4, 2, 1, 4, 2, 1 The block 4, 2, 1 repeats *ad infinitum* starting after t_7 . But $2008 - 7 = 2001$ and $2001 = 3 \times 667$. Hence t_{2008} is the third term in the 667th such block and is therefore 1.