********** **Mathematical Weekly** **********
(week nineteen)

1. Pick **any** natural number n = 1, 2, 3, … , 100, …, 100000000000000, ……

2. Compute $3\times n+1$

3. If the result, m, is an even number, then divide it by 2 to obtain $m/2$

   If the result is an odd number, m, then compute $3\times m+1$

4. Go back to Step 3, repeat the computations

   ……

* I assure you that, by repeating the above steps, you will always end up with 1

As the first example, pick 5 to start. Then you will have:

$$5 \rightarrow 3\times 5+1=16 \rightarrow 16/2=8 \rightarrow 8/2=4 \rightarrow 4/2=2 \rightarrow 2/2=1$$

As the second example, pick 7 to start. Then you will have:

$$7 \rightarrow 22 \rightarrow 11 \rightarrow 34 \rightarrow 17 \rightarrow 52 \rightarrow 26 \rightarrow 13 \rightarrow 40 \rightarrow$$
$$20 \rightarrow 10 \rightarrow 5 \rightarrow 16 \rightarrow 8 \rightarrow 4 \rightarrow 2 \rightarrow 1$$

Don’t believe me? Try again!

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EE, CityU
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