

**Difficulty:** 3/4    **Interest:** 3/4

The prime ant looks along the number line starting at 2. When she reaches a composite number, she divides by its least prime factor, and adds that factor to the previous term, and steps back.

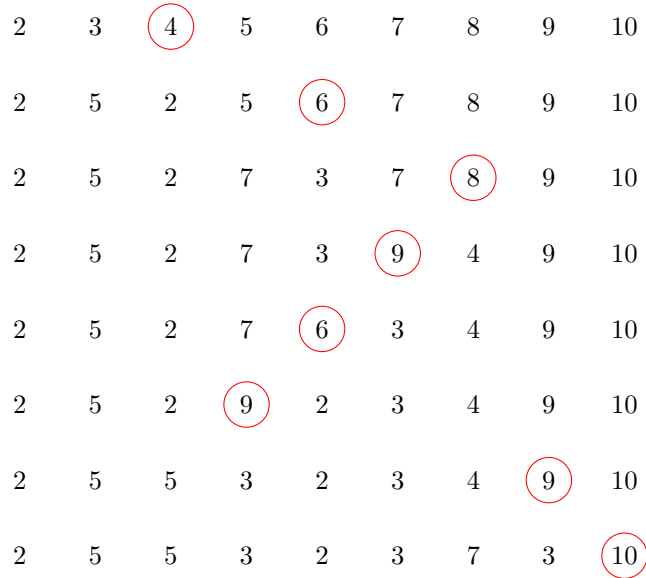


Figure 1: An illustration of the prime ant's positions after the first 7 steps.

**Question.** Does the ant eventually stay to the right of any fixed position?

**Related.**

1. Are there any positions that stay permanently greater than 7? Than 11?
2. Does sequence of numbers converge in the long run? If so, what to?  $(2, 5, 5, 3, 2, \dots)$
3. Let  $S$  be a subset of  $\mathbb{N}$  and let  $f : S \times S^c \rightarrow \mathbb{N}^2$ . For what “interesting” sets  $S$  and functions  $f$  can we answer the above questions?  
(In the example  $S$  is the prime numbers and  $f$  maps  $(p, c) \mapsto (p + \text{lpf}(c), \text{gpf}(c)).$ )

**References.**

<https://codegolf.stackexchange.com/q/144695/53884>

<https://math.stackexchange.com/q/2487116/121988>

<https://oeis.org/A293689>