

## Answer to Question #74851, Math / Discrete Mathematics

Suppose we model the spread of a virus in a certain population as follows. On day 1, one person is infected. On each subsequent day, each infected person gives the cold to two others.

(a) Write down a recurrence relation for this model.

**Answer:**

$$x_n = \begin{cases} 1, & n = 1 \\ 3x_{n-1}, & n > 1 \end{cases}$$

where  $x_n$  is the number of infected persons,  $n$  is the number of days

(b) What are some of the limitations of this model? How does it fail to be realistic?

**Answer:** no one ever recovers, the population is unlimited and no one ever dies

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