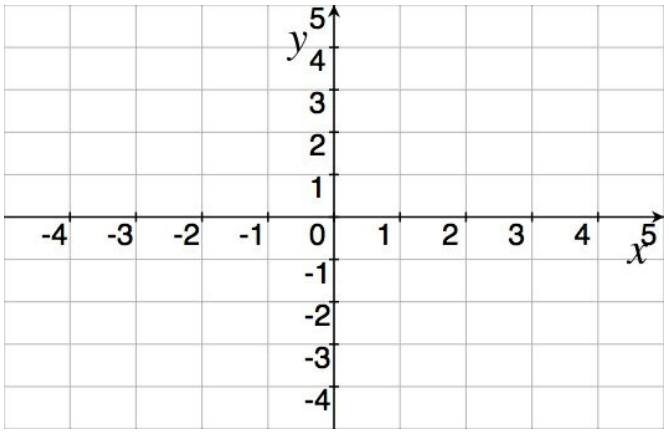
# Sequence Practice

1. Consider the sequence: $\{-3, 2, -\frac{4}{3}, \frac{8}{9}, -\frac{16}{27}, ...\}$

   (a) Find a formula for the general term $a_n$ of the sequence.

   (b) Determine if the sequence converges or diverges. *Justify* your answer.

   (c) Plot $(n, a_n)$ for a few of the terms in the sequence to confirm your work in (b).




2. Let $a_1 = 1$ (an initial condition) and *recursively* define the sequence $a_n = \frac{a_{n-1}^2}{2}$.

   (a) Write down the first few terms of the sequence.

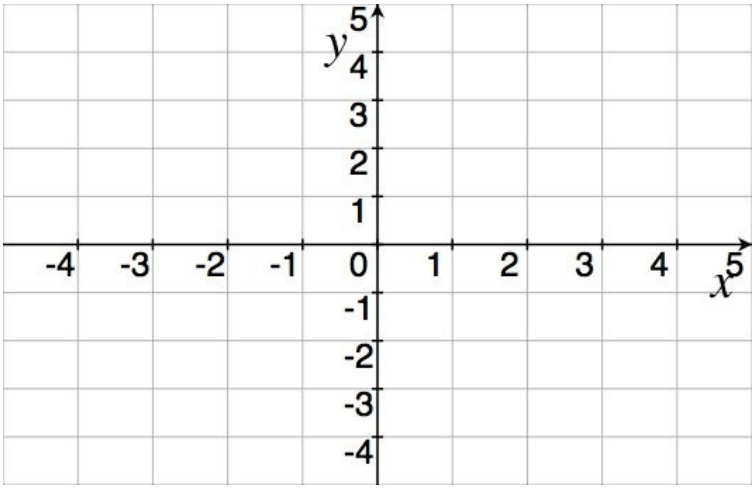
   (b) Determine if the sequence converges or diverges. Yes, this one is harder than (1), just try to make headway.

Note: When $a_n$ depends on any term previous, we call the sequence, recursively defined.

# Cobwebbing Sequences

Adapted from homework created by Jonny Comes.

1. Consider the recursive sequence defined by $a_n = 4a_{n-1} - (a_{n-1})^2$. Identify the recursive function $R(x)$ and *carefully* graph $R$ on the graph provided.




(a) Use cobwebbing to write down a few terms of the sequence if $a_1 = 3$ and determine if the sequence converges.

(b) Use cobwebbing to write down a few terms of the sequence if $a_1 = 2$ and determine if the sequence converges.

(c) Use cobwebbing to write down a few terms of the sequence if $a_1 = -.5$ and determine if the sequence converges.

(d) Use cobwebbing to write down a few terms of the sequence if $a_1 = .5$ and determine if the sequence converges.

(e) Find an initial value for $a_1$ (or a range of initial values) so that the resulting recursively defined sequence will converge to 3.