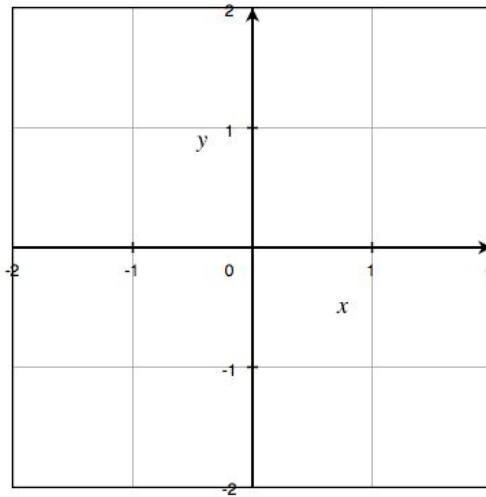# Quiz 4
Math 253

Name:

Show *all* your work (algebraically or geometrically) for each and simplify. No credit is given without supporting work.

1. [2] Explain carefully what the difference between a sequence and a series is.

2. [2] If $|x| < 1$, what is $\displaystyle\sum_{n=0}^{\infty} x^n$?

3. Let $\{a_n\}$ be the sequence defined by $f(a_n) = a_{a+1}$, where $f(x) = \begin{cases} -1; \text{ if } x \le 0 \\ 2x - 1 \text{ otherwise} \end{cases}$

   (a) [1] Draw $f(x)$ on the axis provided below.

   (b) [1] If $a_1 = -2$, write out a few of the terms from the sequence $\{a_n\}$.

   (c) [1] What values can we set a_1 to and have $\{a_n\}$ diverge?

   (d) [3] Write down the values of a_1 that lead the sequence $\{a_n\}$ to converge and what the the corresponding limits are.