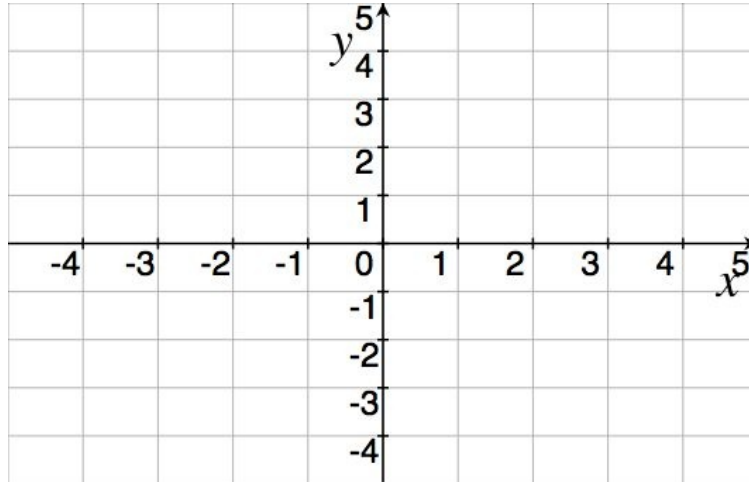# TMATH 124 UH: Quiz 1

Show *all* your work (numerically, algebraically, or geometrically) for each and simplify. No credit is given without supporting work.
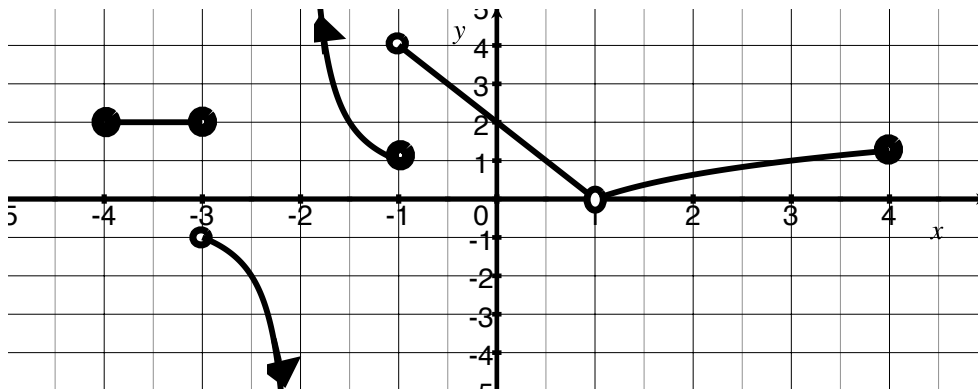
1. Let $f(x) = \begin{cases} (x+2)^2 & \text{if } x \leq 0 \\ 2\log_4(x) & \text{if } 0 < x \end{cases}$

   (a) [2] (WebHW2 #6) *Carefully* graph f on the axis provided

   (b) [1] (§2.2 #12) Determine the values of c for which $\lim\limits_{x \to c} f(x)$ exists.

2. [2] (§2.2 #4) For the function f whose graph is given, estimate the value of each quantity, if it exists.

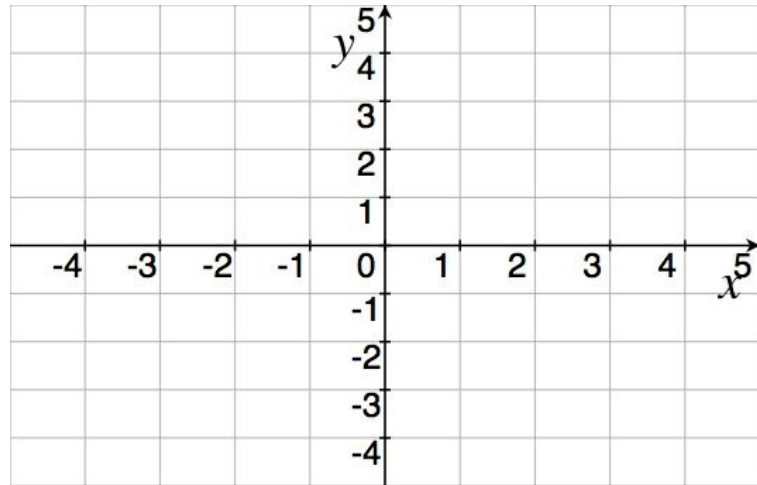 $f(-3)$ $\qquad\qquad\qquad$ $\lim\limits_{x \to 1} f(x)$ $\qquad\qquad\qquad$ $\lim\limits_{x \to -4^+} f(x)$

1

3. [3] (Limit Wks #3) Sketch a graph of a function α that satisfies *all* of the following:

(a) $\lim\limits_{x \to -1} \alpha(x) = 3$

(b) $\lim\limits_{x \to 2^-} \alpha(x) = -3$

(c) $\lim\limits_{x \to 2^+} \alpha(x) = 2$

4. [2] Write the algebraic rule for the function α you created in problem 3.