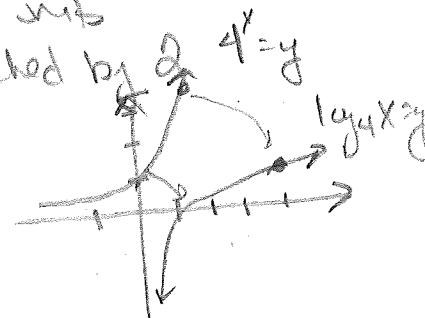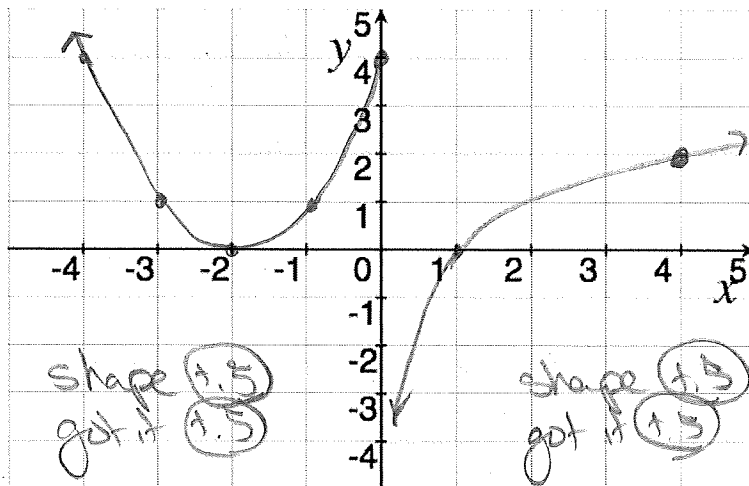# TMATH 124 UH: Quiz 1 *Key*

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

1. Let $f(x) = \begin{cases} (x+2)^2 & \text{if } x \leq 0 \\ 2\log_4(x) & \text{if } 0 < x \end{cases}$ *parabola shifted left 2 smb*
   $\log_4(x)$ vertically streched by 2 $4^y = y$ $\log_4 x \cdot 2$

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

   shape +.5
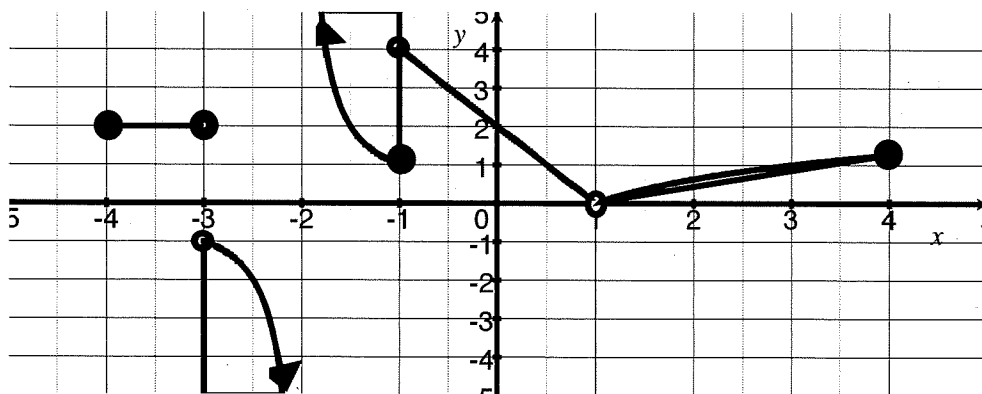   got it +.5

   shape +.5
   got it +.5

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

   all values except $x = 0$ (+1)

   answered exactly wrong +.5

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

   $f(-3)$ $\lim_{x \to 1} f(x)$ $\lim_{x \to -4^+} f(x)$

   2   2   2   (+1)
   (+.5)   (+.5)   1
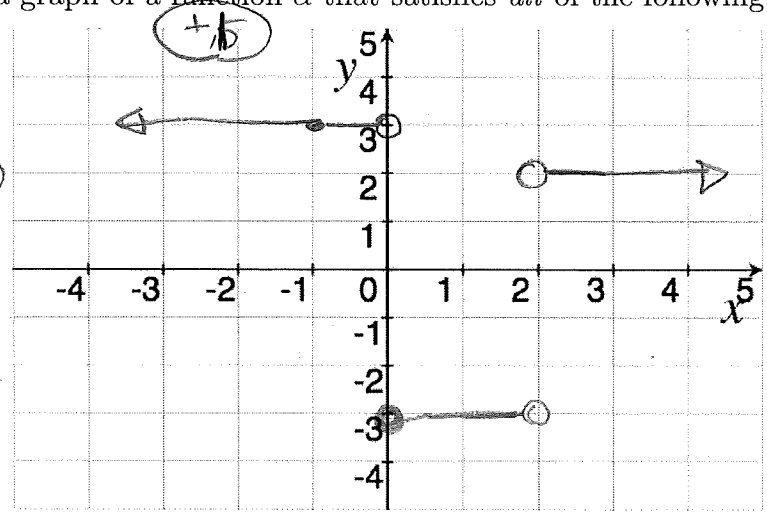
   b/c quality
   will accept -1

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

(a) $\displaystyle\lim_{x \to -1} \alpha(x) = 3$ (+1)

(b) $\displaystyle\lim_{x \to 2^-} \alpha(x) = -3$ (+.5)

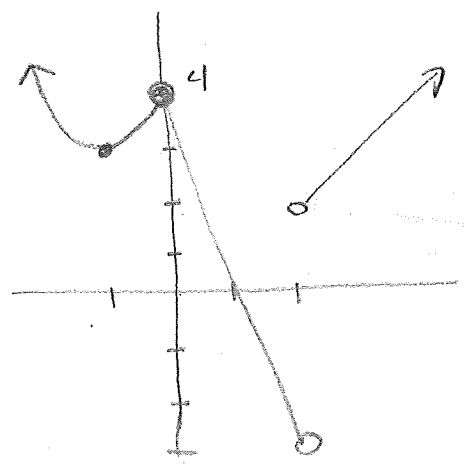(c) $\displaystyle\lim_{x \to 2^+} \alpha(x) = 2$ (+.5)

Note: there are MANY correct answers?

+b

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

$$\alpha(x) = \begin{cases} 3 & \text{if } x < 0 \\ -3 & \text{if } 0 \leq x < 2 \\ 2 & \text{if } 2 < x \end{cases}$$

another answer

4

$$\alpha(x) = \begin{cases} (x+1)^2 + 3 & \text{if } x \leq 0 \\ -\frac{7}{2}x + 4 & \text{if } 0 \leq x < 2 \\ \frac{2}{x} & \text{if } 2 < x \end{cases}$$