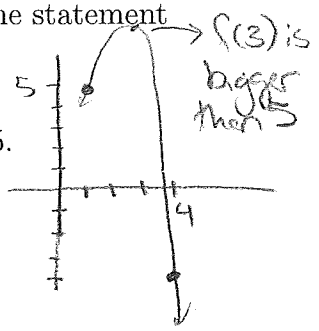
Key

TMATH 124 UH: Quiz 2

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

1. [2] (§2.5 #50) TRUE/FALSE: Circle T in each of the following cases if the statement is *always* true. Otherwise, circle F. Let f be a function.



T (F) If f is continuous, $f(1) = 5$, and $f(4) = -4$, then $-4 \leq f(3) \leq 5$.

(T) F If f is continuous, $f(1) = 5$, and $f(4) = -4$, then f has a zero between $x = 0$ and $x = 4$.

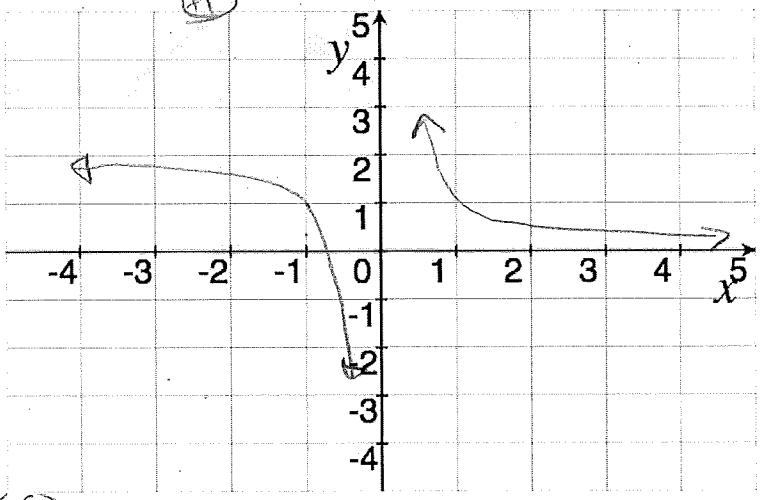
2. [3] (Con't Wks #6) Sketch a graph of a function α that satisfies *all* of the following:

(a) $\lim_{x \to -\infty} \alpha(x) = 2$ (+1.5)

(b) $\lim_{x \to +\infty} \alpha(x) = 0$ (+1.5)

(c) α is not continuous at $x = 0$ (+1)

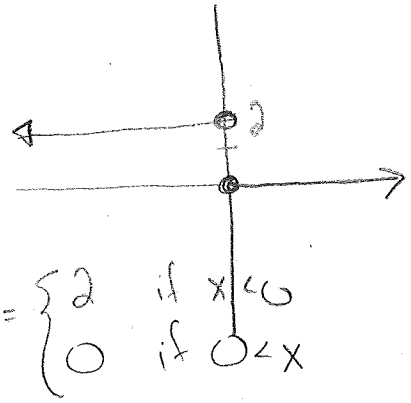
(+1)



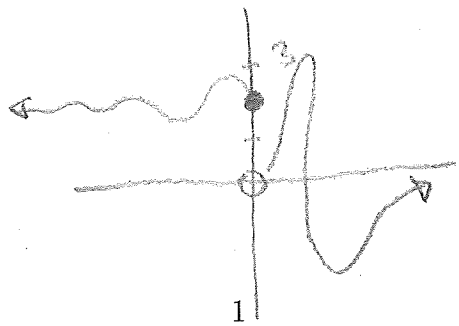
Note: there are MANY correct answers

$$\alpha(x) = \begin{cases} \frac{1}{x} + 2 & \text{if } x < 0 \\ \frac{1}{x} & \text{if } 0 < x \end{cases}$$

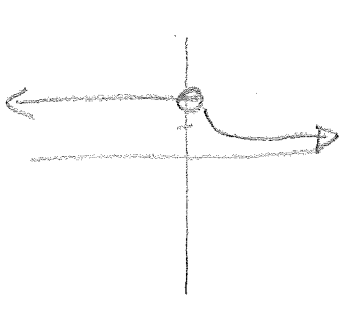
other answers



another answer



another answer



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

3. [2] (WebHW3 #4) Find the limit $\lim_{x\to 5} \dfrac{x^2-7x+6}{x-5}$

tried limit laws/alg ±1

note LLS Does NOT work b/c zero in denominator

(+.5) TABLE (+.5)

x	4.9	4.999	5.0001	5.1
$\frac{x^2-7x+6}{x-5}$	Big	BIG	-BIG	-Big

(+.5)

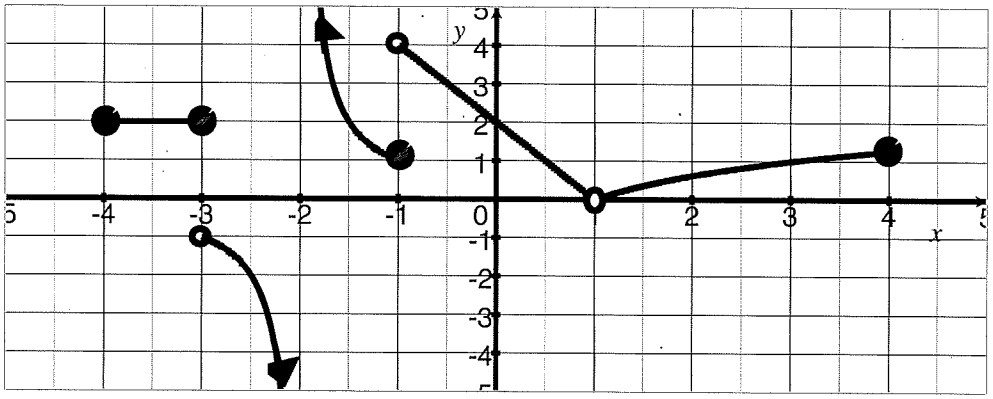
DUE (+.5)

$\lim_{x\to 5} \dfrac{(x-6)(x-1)}{x-5}$

don't see my corrections.

$\lim_{x\to 5^-} \dfrac{x^2-7x+6}{x-5} = \infty \neq -\infty = \lim_{x\to 5^+} \dfrac{x^2-7x+6}{x-5}$

4. [3] (WebHW3 #1) For the function f whose graph is given, estimate the value of each quantity, if it exists. Note there are solid dots at $(-3,2)$, $(-1,1)$, and $(4,1.2)$.



$\lim_{x\to 1} f(x)$

$\lim_{x\to 0} \dfrac{2f(x)}{3+f(x)}$ LLS

0

(+1)

limit laws (+1)

$\lim_{x\to 0} 2f(x)$

$\lim_{x\to 0} (3+f(x))$

LL3 & LC1

$\dfrac{2\lim_{x\to 0} f(x)}{\lim_{x\to 0} 3 + \lim_{x\to 0} f(x)} = \dfrac{2(2)}{3+2} = \dfrac{4}{5}$ (+1)