*Key*

TMATH 124 MW: 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, $f(0) = -5$, and $f(4) = 4$, then $-5 \le f(2) \le 4$.
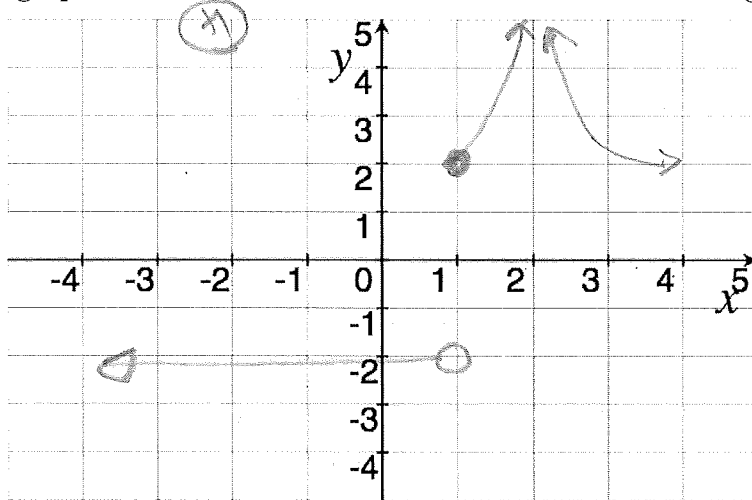
    (T) F If f is continuous, $f(0) = -5$, and $f(4) = 4$, then f has a root between $x = 0$ and $x = 4$.

    false — $f(2)$ less than -5?
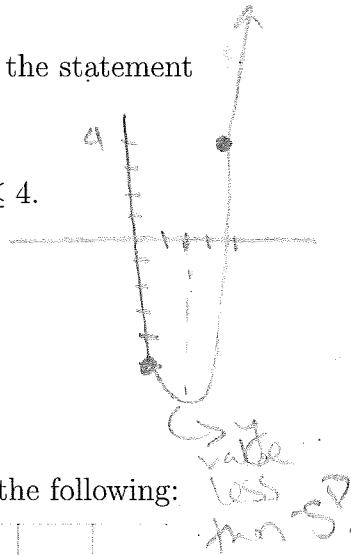
2. [3] (Con't Wks #6) Sketch a graph of a function α that satisfies *all* of the following:
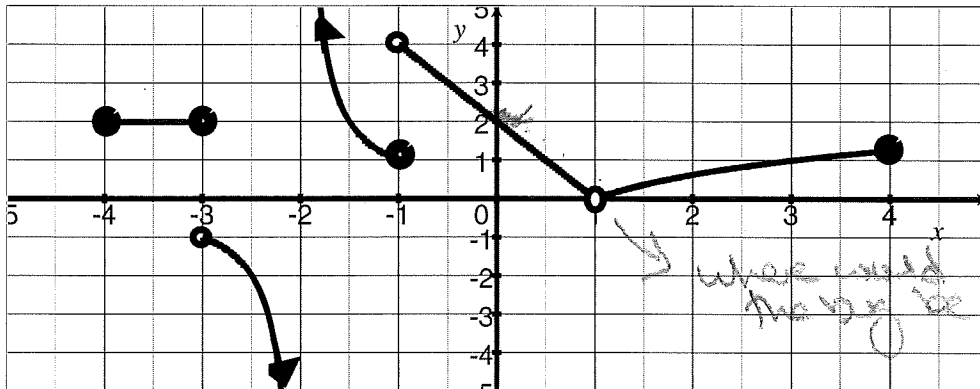
    (a) $\displaystyle\lim_{x \to 2} \alpha(x) = \infty$ ✓

    (b) α is not continuous at $x = 1$ ✓

    note there are MANY correct answers!

3. [3] (Lecture 1/13) 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 $(4,1.2)$.

$f(0)$

α
(n)

$f'(0)$

slope of line
tangent to f
@ $x=0$

≈ -1
(n)

$\dfrac{d}{dx}f|_{x=1}$

slope of line
tangent to f
@ $x=1$

trick question?
DNE (n)

note ... slope of -1 +.5

4. [2] (WebHW4 #10) Find:

Notation +.5

$$\lim_{x\to\infty}\frac{5x-9}{2x+2}$$

Matthew's Method ←

$= \lim_{x\to\infty}\frac{5x}{2x} = \frac{5}{2}$ +.5

Big-Little Thm   +.5   or

$\lim_{x\to\infty}\frac{5x-9}{2x+2}\left(\frac{\frac{1}{x}}{\frac{1}{x}}\right)$

$\lim_{x\to\infty}\frac{5x - 9/x}{2x - 2/x}$ +.5

$\lim_{x\to\infty}\frac{5 - 9/x \to 0}{2 - 2/x \to 0}$

$\frac{5}{2}$ +.5 got it

table/numeric +.5

x	100	100000
$\frac{5x-9}{2x+2}$		

+.5

got it +.5

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