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TMATH 124am: Quiz 2 Key

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

1. [3] (§2.5 #5) Sketch the graph of an example function f that satisfies the following conditions:

   (a) $\lim_{x\to 1^+} f(x) \neq \lim_{x\to 1^-} f(x)$

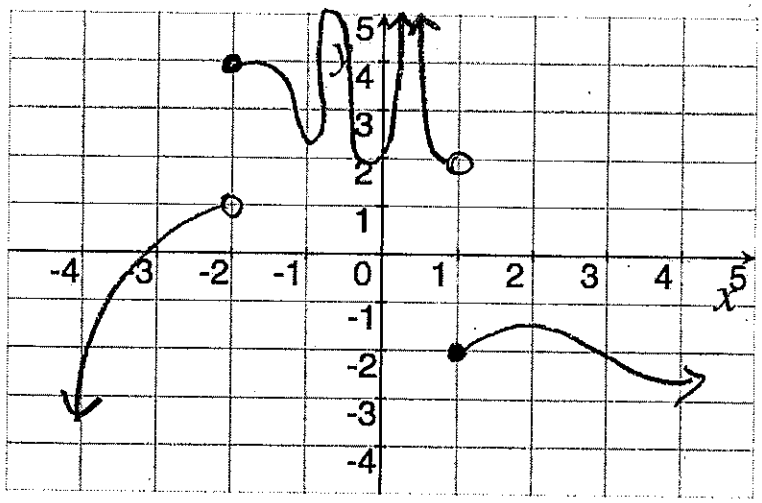
   +1

   (b) f is discontinuous at -2

   +1

   (c) f is continuous from the right at -2

   +1



2. [2] (WebHW3 #10) If we know $3x-5 \leq f(x) \leq x^2-3x+4$ for all $x \geq 0$, find $\lim_{x\to 3} f(x)$. *Justify* your conclusions

Notice $\lim_{x\to 3}(3x-5) = 3(3)-5 = 4$

and $\lim_{x\to 3}(x^2-3x+4) = 3^2-3(3)+4 = 4$. +.5

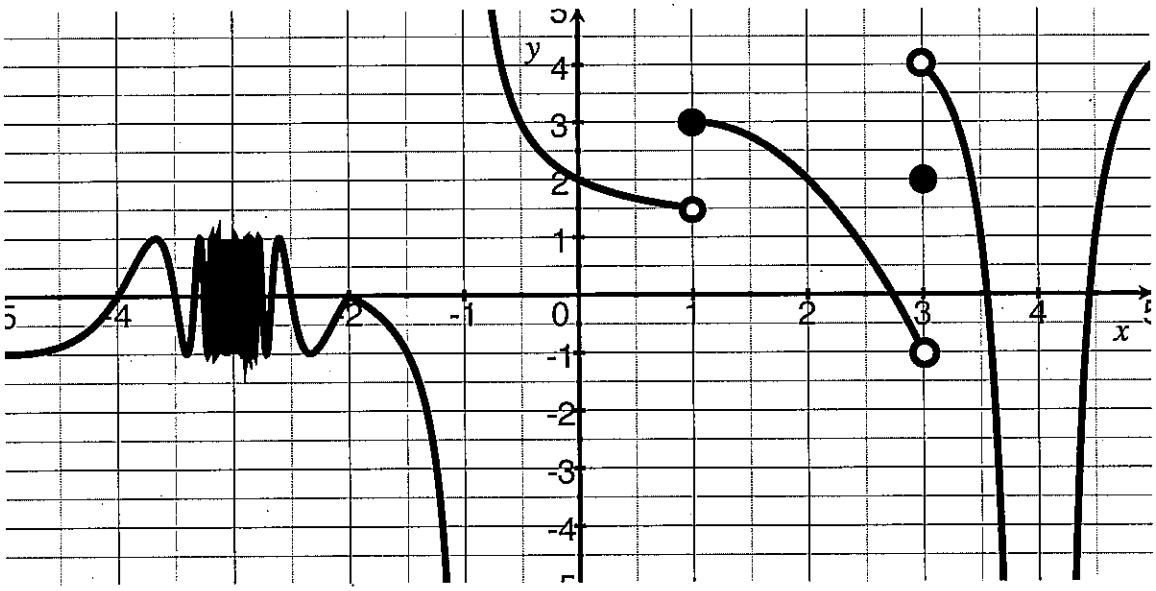
Since f is continuous the squeeze theorem +.5

implies $\lim_{x\to 3} f(x) = 4$.

+.5

Notation +.5

3. The graph of a function R is given below:



(a) [3] (Con't wks) State the numbers at which R is discontinuous.

not cont when

$x = 4, 3, 1, -1$ and -3

get 1 (+1)
get 3 (+2)
get all (+3)

(b) [2] (§2.3 #2) Evaluate $\lim_{x\to 1^+}[2R(x) - 5]$ $= \lim_{x\to 1^+}(2R(x)) - \lim_{x\to 1^+} 5$ law #2

$= 2\lim_{x\to 1^+} R(x) - \lim_{x\to 1^+} 5$ law #3

$= \underbrace{2(3)}_{(+1)} - \underbrace{\lim_{x\to 1^+} 5}_{(+.5)}$ by def of right limits

$= 6 - 5$ b/c $\lim_{x\to a} c = c$ when c is a constant for all a.

$= 1$

Notation (+.5)