Math 1A (10:30am – 11:20am)
Quiz 1 Version D
Fri Jan 14, 2011

What month is your birthday ? ___ ___
What are the first 2 digits of your address ? ___ ___
What are the last 2 digits of your zip code ? ___ ___
What are the last 2 digits of your DeAnza ID number ? ___ ___

SCORE: ___ / 30 POINTS

NO CALCULATORS ALLOWED

SHOW PROPER ALGEBRAIC WORK AND USE PROPER NOTATION

YOU DO NOT NEED TO SHOW THE USE OF THE LIMIT LAWS UNLESS SPECIFICALLY ASKED FOR

Let $f(x) = \begin{cases} 3x+17, & \text{if } x < -3 \\ 5-x, & \text{if } -3 < x \le 2 \\ 11-4x, & \text{if } x > 2 \end{cases}$.

SCORE: ___ / 7 POINTS

[a] Is $f(x)$ continuous at $x = 2$?
If yes, show that all three conditions of continuity are satisfied. If no, show that at least one condition is not satisfied.

1 YES.
½ $f(2) = 5-2 = 3$
$\lim_{x\to 2^-} f(x) = \lim_{x\to 2^-} (5-x) = 3$ 1
$\lim_{x\to 2^+} f(x) = \lim_{x\to 2^+} (11-4x) = 3$ 1
½ $\lim_{x\to 2} f(x) = 3 = f(2)$ 1

[b] Is $f(x)$ continuous at $x = -3$?
If yes, show that all three conditions of continuity are satisfied. If no, show that at least one condition is not satisfied.

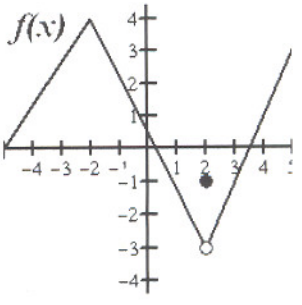
1 NO. $f(-3)$ DNE 1

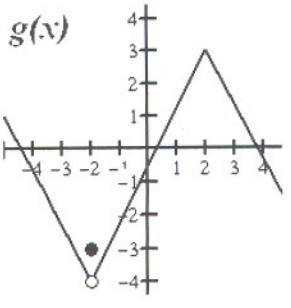
The graphs of f and g are shown on the right.

SCORE: ___ / 5 POINTS

Find $\lim_{x\to -2} [xf(x) - 5g(x)]$, **showing the proper use of the limit laws to justify your answer.**

$= \lim_{x\to -2} [x f(x)] - \lim_{x\to -2} [5g(x)]$ 1
$= \lim_{x\to -2} x \lim_{x\to -2} f(x) - \lim_{x\to -2} 5 \lim_{x\to -2} g(x)$ 1
$= (-2)(4) - 5(-4)$
$= 12$ 2





State the Squeeze Theorem. **SCORE: ___ / 2 POINTS**

SEE 7:30 VERSION A

State the complete definition of "vertical asymptote". **SCORE: ___ / 2 POINTS**

SEE 7:30 VERSION A

Evaluate the following limits. **SCORE: ___ / 14 POINTS**
The answer should be a number, ∞ or $-\infty$. **Write DNE only if the other possibilities do not apply.**

[a] $\lim_{x\to 3} \dfrac{\frac{8}{c+1}-2}{c-3}$ $\frac{0}{0}$

$= \lim_{c\to 3} \dfrac{8-2(c+1)}{(c-3)(c+1)}$

$= \lim_{c\to 3} \dfrac{6-2c}{(c-3)(c+1)}$ | |

$= \lim_{c\to 3} \dfrac{-2(c-3)}{(c-3)(c+1)}$ | | FOR FACTORING NUMERATOR | FOR CANCELLING

$= \dfrac{-2}{4}$

$= -\dfrac{1}{2}$ |

[b] $\lim_{y\to 4} \dfrac{y^3-8}{2y^2-7y-12} = \dfrac{56}{-8} = \dfrac{-7}{1}$ | |

[c] $\lim_{t\to 2} \dfrac{t-2}{3-\sqrt{t^2+5}}$ $\frac{0}{0}$

$= \lim_{t\to 2} \dfrac{(t-2)(3+\sqrt{t^2+5})}{9-(t^2+5)}$

$= \lim_{t\to 2} \dfrac{(t-2)(3+\sqrt{t^2+5})}{4-t^2}$ | | | -1

$= \lim_{t\to 2} \dfrac{(t-2)(3+\sqrt{t^2+5})}{(2-t)(2+t)}$ | | FOR FACTORING DENOMINATOR | FOR CANCELLING

$= -\dfrac{6}{4}$

$= -\dfrac{3}{2}$ | |

[d] $\lim_{x\to -1^-} \dfrac{x^3-3}{1+x}$ $\dfrac{-4}{0^-}$ OR $\begin{matrix} x^3-3 \to -4 \\ 1+x \to 0^- \end{matrix}$

$= \dfrac{\infty}{1}$ |

SUBTRACT 1 POINT TOTAL IF YOU FORGOT ANY OF THESE