Name: _____ _____ **/ 25**

Circle one: Faudree (F01) | Bueler (F02) | VanSpronsen (UX1)

There are 25 points possible on this quiz. No aids (book, calculator, etc.) are permitted. Show all work for full credit.

1. [9 points] Evaluate each limit below. Your answer for each should be either a real number, $+\infty$, $-\infty$, or DNE. Show your work to receive full credit.

a. $\lim_{x\to -3} \dfrac{x^2+2x-3}{x^2+5x+6}$

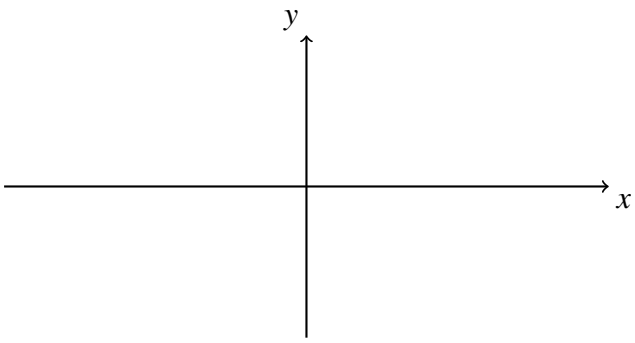
b. $\lim_{x\to 4} \dfrac{2-\sqrt{x}}{4x-x^2}$

c. $\lim_{h\to 0^-} \dfrac{2h^2+14h}{|h|}$

2. [4 points] Use the Intermediate Value Theorem to **show** that the equation $e^x = 6-8x$ has a root in the interval $(0,1)$.

3. [8 points] Consider the function $f(x) = \begin{cases} 2-2x & x<1 \\ 3 & x=1 \\ \sqrt{x-1} & x>1. \end{cases}$

a. On the axes below, sketch a graph of $f(x)$.

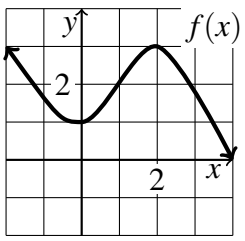


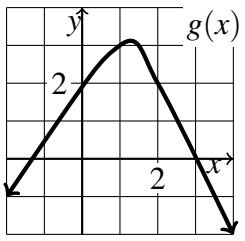
b. Evaluate the limit below or explain why the limit fails to exist.

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

c. Is f continuous at $x = 1$? Explain using the definition of continuity.

4. [4 points] The graphs of $f(x)$ and $g(x)$ are given. Use them to evaluate each limit, if it exists. If the limit does not exist, explain why.





a. $\lim_{x\to 2} \dfrac{5f(x)}{2+g(x)} =$

b. $\lim_{x\to 2} 4x + f(x) =$