

Name: _____

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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. $\lim_{x \rightarrow -3} \frac{x^2 + 4x + 3}{x^2 + x - 6}$

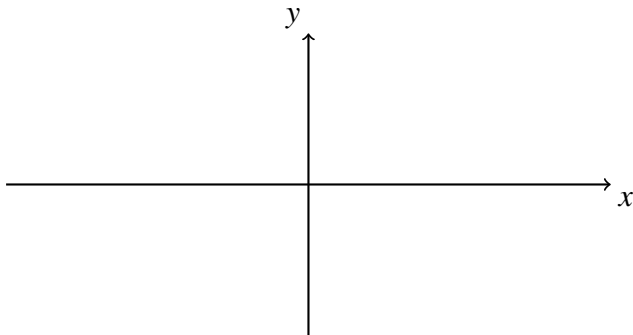
b. $\lim_{x \rightarrow 9} \frac{3 - \sqrt{x}}{9x - x^2}$

c. $\lim_{h \rightarrow 0^-} \frac{2h^2 + 10h}{|h|}$

2. [4 points] Use the Intermediate Value Theorem to **show** that the equation $e^x = 4 - 5x$ has a root in the interval $(0, 1)$.

3. [8 points] Consider the function $f(x) = \begin{cases} 2x+4 & x < 0 \\ 1 & x = 0 \\ \sqrt{x+16} & x > 0. \end{cases}$

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

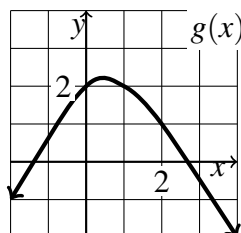
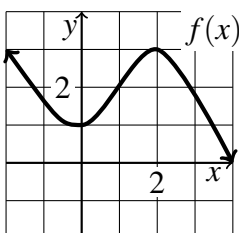


b. Evaluate the limit below or explain why the limit fails to exist.

$$\lim_{x \rightarrow 0} f(x) =$$

c. Is f continuous at $x = 0$? 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. $\lim_{x \rightarrow 2} \frac{5f(x)}{2 + g(x)} =$

b. $\lim_{x \rightarrow 2} x^2 f(x) =$