Name: ————————————————————————————   ————————— / 22

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

1. [4 points]

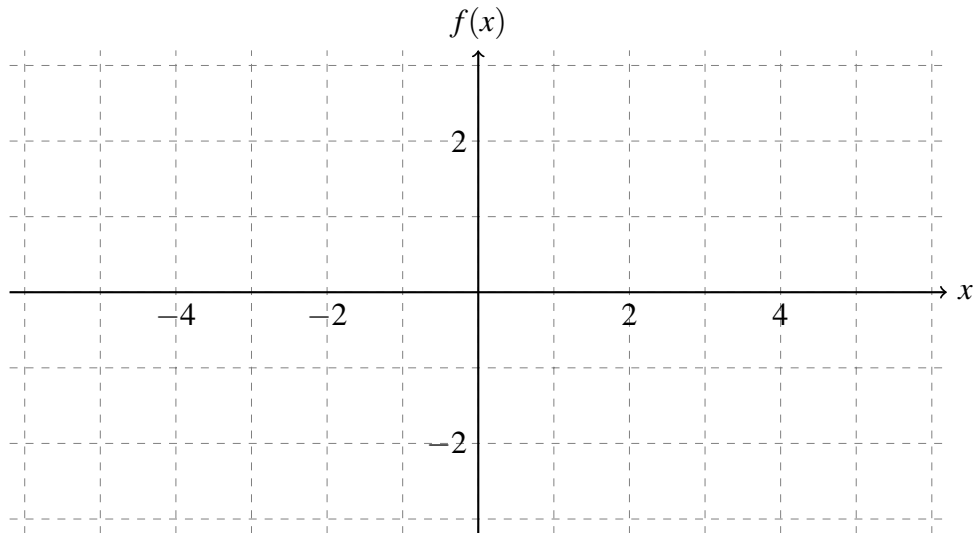   **a.** Why is the following not a true statement? $\dfrac{x^2 - 6x}{x} = x - 6$

    b. Nevertheless, explain why the following equation is correct. $\lim\limits_{x \to 0} \dfrac{x^2 - 6x}{x} = \lim\limits_{x \to 0} x - 6$

2. [4 points] Compute $\lim\limits_{x \to 5} \dfrac{\frac{1}{5} - \frac{1}{x}}{5 - x}$.

3. [4 points] Compute $\lim\limits_{h \to 0} \dfrac{(2 + h)^2 - 4}{h}$

4. [6 points] Consider the function $f(x) = \begin{cases} \frac{3}{1-x} & x \le 0 \\ 3\sin(x) & x > 0. \end{cases}$

a. In the diagram below, graph $f(x)$.

b. Explain why $f(x)$ isn't continuous at $x = 0$.

5. [4 points] Use the Intermediate Value Theorem to justify the claim that there exists a number x satisfying $2^x - x - 4 = 0$.