
Lab Time:

Your Name:

- a. (5 points.) The function $f(x)$ below is not continuous at $x = 2$:

$$f(x) = \begin{cases} \frac{1 + \sin(\pi x)}{\sqrt{x+7}}, & x \neq 2 \\ 3, & x = 2 \end{cases}$$

Use the information above to evaluate the following limit:

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

Explain your answer.

- b. (5 points.) Explain why the following function is (or **is not**) continuous at $h = 0$. (You do not need to evaluate a limit or do much calculation to answer this question.)

$$Q(h) = \frac{(3+h)^{100} - 3^{100}}{h}$$

2. **BONUS** (5 points.) Obtain a relatively simple expression for $\lim_{h \rightarrow 0} Q(h)$.