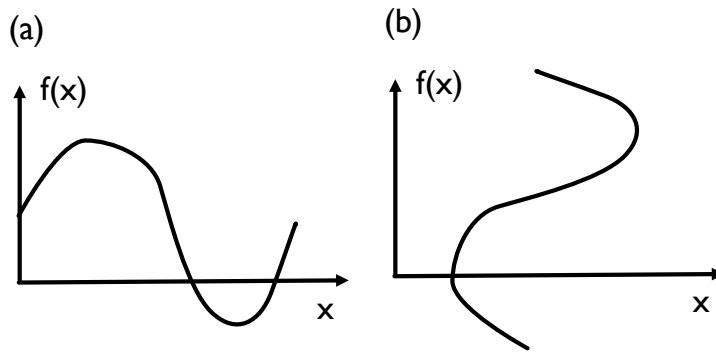


Computational Neuroscience: Neural Dynamics

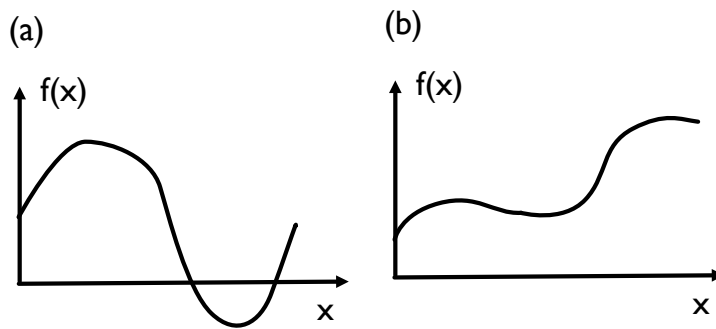
Exercise 0, hand in by October 19, 2023

This is only to find out about your math background... for you, a cheap shot at getting a few bonus points...

1. Which of panels below, (a) and/or (b), depict functions?



2. Which of panels below, (a) and/or (b), depict invertible functions?



3. To which limit value does this function

$$f(x) = \frac{1}{1 + \exp(-x)}$$

converge for $x \rightarrow \infty$

4. What is the derivative of this function of time:

$$u(t) = u(0) \exp(-t/\tau)$$

5. What is the integral of this function of time (starting from time= zero):

$$u(t) = 1 - \cos(\omega t)$$

6. Are the two vectors,

$$\begin{pmatrix} -1 \\ 1 \end{pmatrix} \text{ and } \begin{pmatrix} 1 \\ -1 \end{pmatrix},$$

linearly dependent?