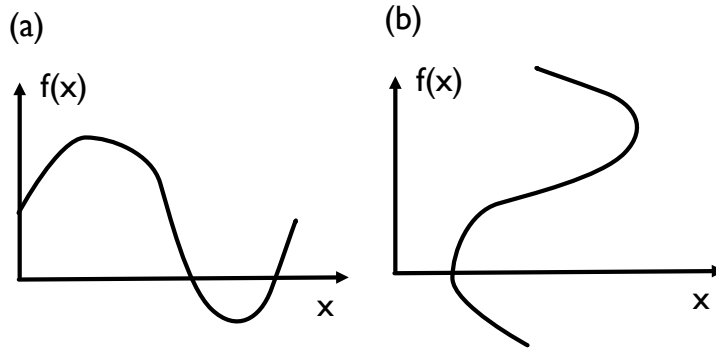


## Computational Neuroscience: Neural Dynamics

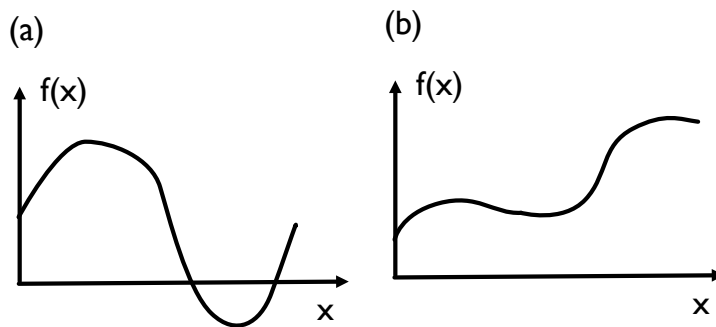
Mathquiz, hand in by **October 12, 2024 (Saturday)**

This is only to find out about your math background... and you can try out the uploading feature and how you will do the exercises (on paper, electronically etc)...

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 independent?