4. Sketch the graph of the function and use it to determine the values of a for which $\lim_{x \to a} f(x)$ does <u>not</u> exist.

$$f(x) = \begin{cases} 1 + \sin x & \text{if } x \leq 0 \\ \cos x & \text{if } 0 \leq x \leq \pi \\ \sin x & \text{if } x > \pi \end{cases}$$