1. [5 points] Determine whether the following statements are True or False. Provide a justification or a counter-example (an example that contradicts the statement).

(a) \( \lim_{x \to -1} f(x) = 4 \) implies that \( f(-1) = 4 \).

(b) If \( g(x) = \begin{cases} x^2 - 6x + 8 & x < 4 \\ x - 4 & x \geq 4 \end{cases} \), then \( \lim_{x \to 4} g(x) \) does NOT exist.

2. [4 points] Find the vertical and horizontal asymptotes of \( f(x) = \frac{x^2}{x - \pi} \).
3. [3 points] Sketch the graph of a function $f(x)$ satisfying all the following conditions:

- $f$ is defined everywhere except at $x = 2$ and $x = -2$.
- $\lim_{x \to 2^+} f(x) = -\infty$ and $\lim_{x \to 2^-} f(x) = -\infty$
- $f$ has a finite limit at $x = -2$.
- $f$ has a horizontal asymptote at $y = 1$.

Make sure your graph passes the vertical line test to be a function!