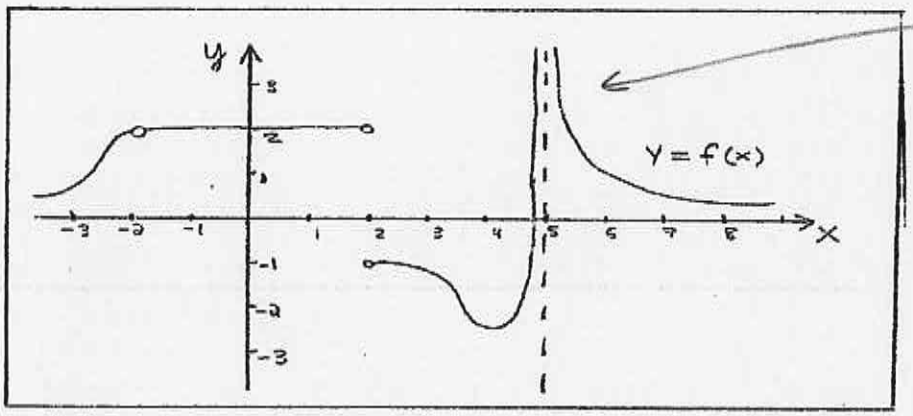
(close to what I gave, not quite same)

Math 126, in-class exercise 3 on limits: Name:

1.) Consider the graph below to find the indicated limits. Write the best description for the non-existent cases, write d.n.e or ∞ or $-\infty$ as appropriate.



$\lim_{x \to 5} f(x) = \infty$

$\lim_{x \to \infty} f(x) = \lim_{x \to -\infty} f(x) = 0$

$\lim_{x \to -2} (f(x)) = 2$ but, $f(-2)$ d.n.e.

$\lim_{x \to 2^-} f(x) = 2$ whereas $\lim_{x \to 2^+} f(x) = -1$ hence $\lim_{x \to 2} f(x)$ d.n.e.

2.) For the case-wised defined function $f(x) = \begin{cases} x^2 + 2 & \text{if } x < 2 \\ \frac{1}{x} & \text{if } x \geq 2 \end{cases}$ find the following limits:

$\lim_{x \to 2^-} f(x) = \lim_{x \to 2^-} (x^2 + 2) = 6.$

$\lim_{x \to 2^+} f(x) = \lim_{x \to 2^+} \left(\frac{1}{x}\right) = \frac{1}{2}$

$\lim_{x \to 2} f(x)$ d.n.e since $6 \neq \frac{1}{2}$.

3.) Calculate the following indeterminant limit:

$\lim_{x \to -2} \left(\frac{12x+24}{x^2-4}\right) = \lim_{x \to -2} \left(\frac{12(x+2)}{(x-2)(x+2)}\right) = \lim_{x \to -2} \left(\frac{12}{x-2}\right)$

$= \frac{12}{-4}$

$= \boxed{-3.}$