Discovering Horizontal and Vertical Asymptotes

(1) *Example*: Sketch the function that satisfies the stated conditions.

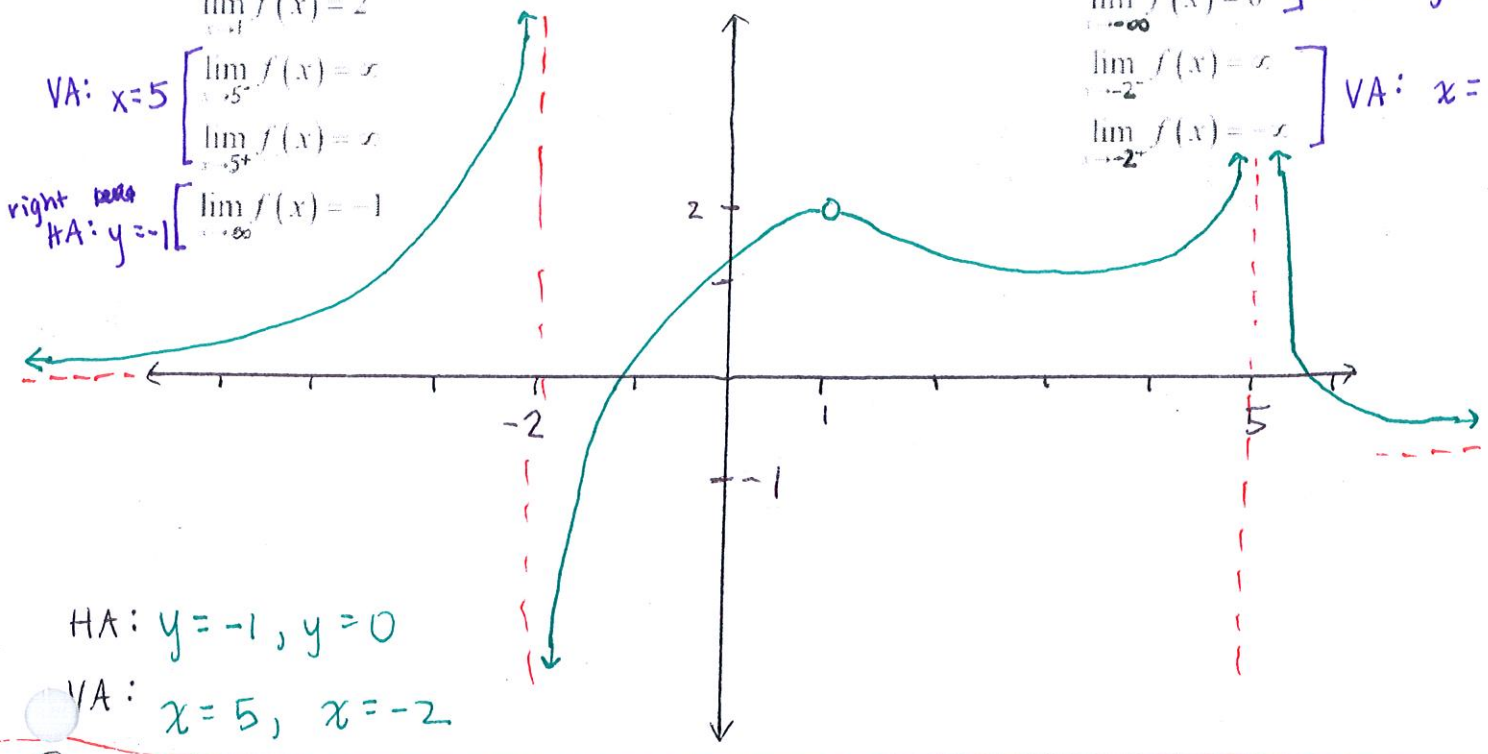
$\lim_{x \to 1} f(x) = 2$

VA: $x = 5$ $\left[\lim_{x \to 5^-} f(x) = \infty \right.$, $\left. \lim_{x \to 5^+} f(x) = \infty \right.$

right HA: $y = -1$ $\left[\lim_{x \to \infty} f(x) = -1 \right.$

left HA: $y = 0$ $\left[\lim_{x \to -\infty} f(x) = 0 \right.$

VA: $x = -2$ $\left[\lim_{x \to -2^-} f(x) = \infty \right.$, $\left. \lim_{x \to -2^+} f(x) = -\infty \right.$



HA: $y = -1$, $y = 0$

VA: $x = 5$, $x = -2$

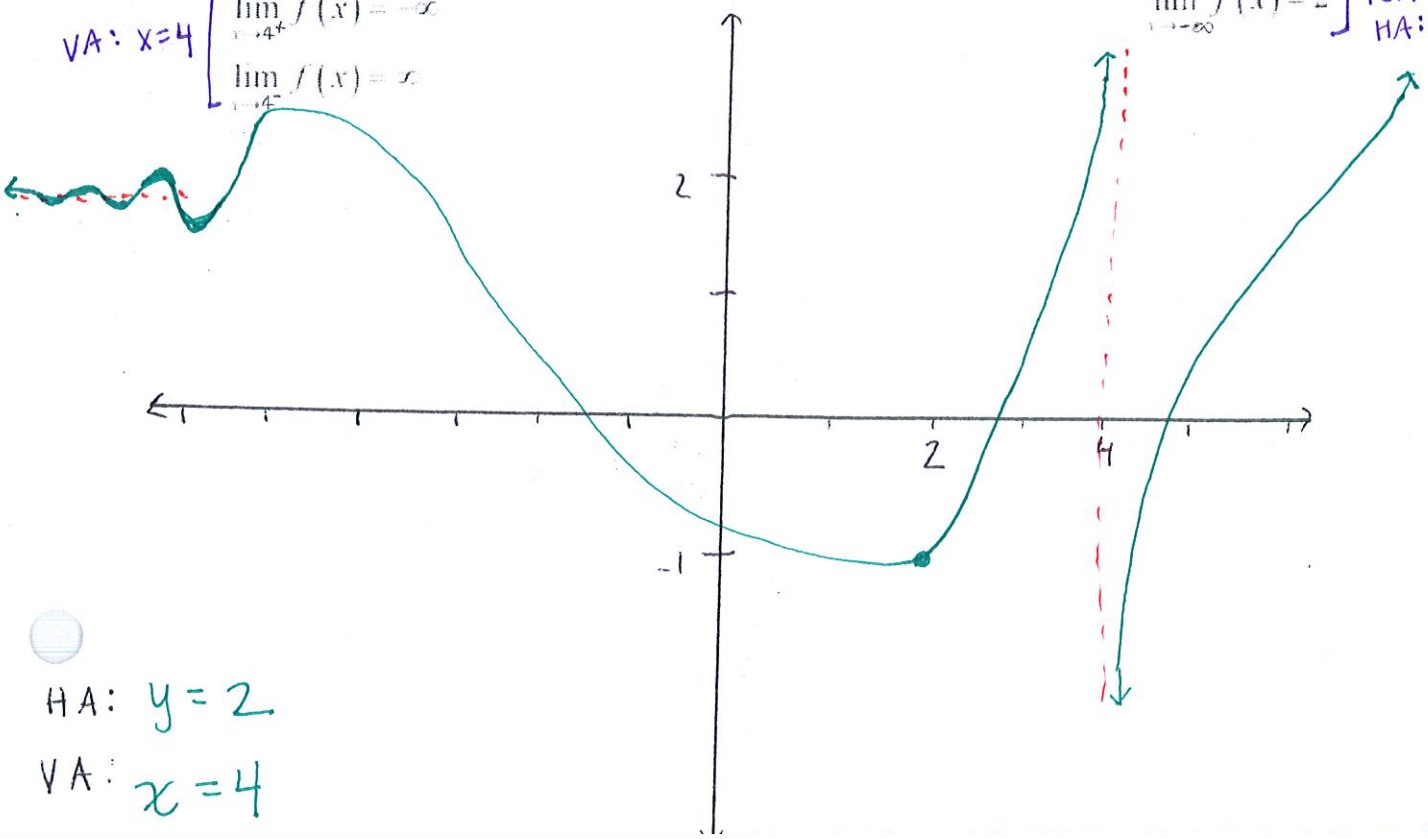
(2) *Example*: Sketch the function that satisfies the stated conditions.

$\lim_{x \to 2} f(x) = -1$

VA: $x = 4$ $\left[\lim_{x \to 4^+} f(x) = -\infty \right.$, $\left. \lim_{x \to 4^-} f(x) = \infty \right.$

right HA: none $\left[\lim_{x \to \infty} f(x) = \infty \right.$

left HA: $y = 2$ $\left[\lim_{x \to -\infty} f(x) = 2 \right.$



HA: $y = 2$

VA: $x = 4$