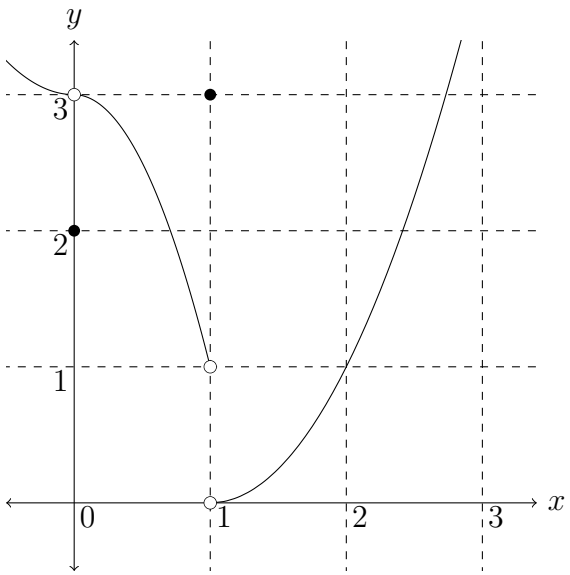
# The Limit of a Function

Aside from problem 1, **solutions should show all of your work, not just a single final answer.**

1. The graph of $y = f(x)$ is below. Use it to compute each limit or explain why it doesn't exist.




(a) $\lim_{x\to 0^-} f(x)$ (b) $\lim_{x\to 0^+} f(x)$ (c) $\lim_{x\to 0} f(x)$ (d) $f(0)$

(e) $\lim_{x\to 1^-} f(x)$ (f) $\lim_{x\to 1^+} f(x)$ (g) $\lim_{x\to 1} f(x)$ (h) $f(1)$

(i) $\lim_{x\to 2^-} f(x)$ (j) $\lim_{x\to 2+} f(x)$ (k) $\lim_{x\to 2} f(x)$ (l) $f(2)$

2. Determine whether the following limits are finite, $\infty$, or $-\infty$. If the limit does not exist for any other reason, write DNE with a justification.

(a) $\lim_{x\to 1} \dfrac{\sqrt{x}}{2(x-1)^2}$ (b) $\lim_{x\to 1+} \dfrac{x-2}{x-1}$ (c) $\lim_{x\to 0} \dfrac{1}{x} - \dfrac{1}{x^2}$

3. T/F (with justification) The line $x = 1$ is a vertical asymptote of the graph of $y = \dfrac{x^2-1}{x^2-2x+1}$.

4. T/F (with justification) The line $x = 1$ is a vertical asymptote of the graph of $y = \dfrac{x^2-2x+1}{x^2-1}$.