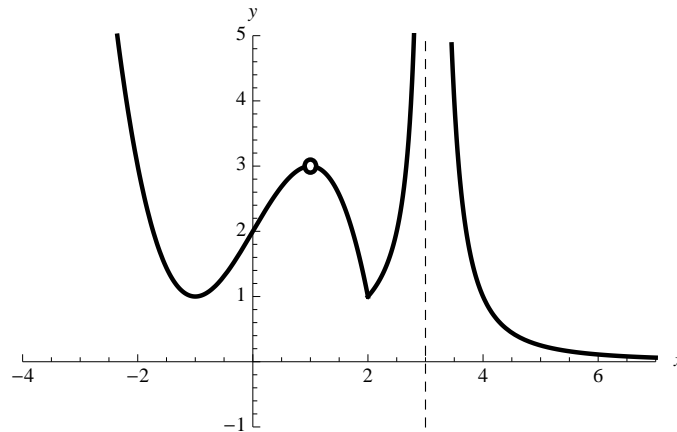


1. [15 points] The following figure shows the graph of $y = f(x)$ for some function f . The dotted line signifies a vertical asymptote.



- a. [12 points] Using the graph, give the values of each of the following quantities if they exist. Choose your answer in each part from the numbers 0, 1, 2, 3 or the words “Does not exist.” Answers may be used more than once—or not at all.

- i) $f(1)$ = Does not exist.
- ii) $f(2) = 1$
- iii) $f(3)$ = Does not exist.
- iv) $f'(-1) = 0$.
- v) $f'(1) =$ Does not exist.
- vi) $f'(2) =$ Does not exist.
- vii) $\lim_{x \rightarrow +\infty} f(x) = 0$.
- viii) $\lim_{x \rightarrow 3} f(x) =$ Does not exist.
- ix) $\lim_{x \rightarrow 2} f(x) = 1$.
- x) $\lim_{x \rightarrow 1} f(x) = 3$.
- xi) $\lim_{x \rightarrow -1} f(x) = 1$.
- xii) $\lim_{x \rightarrow -\infty} f(x) =$ Does not exist.

- b. [3 points] Still looking at the graph, is f continuous at the following x values? (Yes or No)

- i) $x = 1$, No. ii) $x = 2$, Yes. iii) $x = 3$, No.