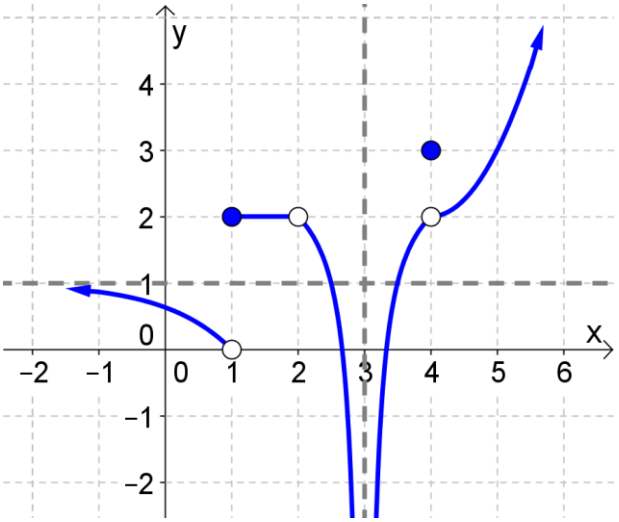
1.



Find the following limits, given the graph of $f(x)$ above.

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

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

$\lim_{x\to 3^-} f(x)$ $\lim_{x\to 3^+} f(x)$ $\lim_{x\to 3} f(x)$

$\lim_{x\to 4^-} f(x)$ $\lim_{x\to 4^+} f(x)$ $\lim_{x\to 4} f(x)$

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

2. Find each of the following limits.

a) $\lim_{x\to 1} \frac{2x+3}{x+1}$

b) $\lim_{x\to 2} \frac{x^2+x-6}{x-2}$

c) $\lim_{x\to+\infty} \frac{x^2+x-5}{1-2x-x^3}$

d) $\lim_{x\to 3} \frac{2x+3}{x-3}$

3. Find the following limits given that $f(x) = \begin{cases} x^2+2 & \text{if } 0 < x \leq 3 \\ \frac{1}{x-3} & \text{if } x > 3 \end{cases}$

a) $\lim_{x\to 3^-} f(x)$

b) $\lim_{x\to 3^+} f(x)$

c) $\lim_{x\to 3} f(x)$

d) $\lim_{x\to 0^+} f(x)$

4. Is $f(x) = \frac{x-4}{2x-4}$ continuous at $x = 2$? Why or why not?

5. Is $f(x) = 3x^2 + 2x - 1$ continuous at $x = 0$? Why or why not?

6. Is $f(x) = \begin{cases} 13 & \text{if } x \leq -2 \\ 2x^2 + 5 & \text{if } x > -2 \end{cases}$ continuous at $x = -2$? Why or why not? (Be sure to use the definition of continuous. That is, show $\lim_{x \to -2} f(x) = f(-2)$.)

7. List all values of x for which $f(x) = \frac{x-1}{x^2-x}$ is <u>not</u> continuous.

Q: What is the beginning of eternity, the end of time and space, the beginning of every end, and the end of every race?