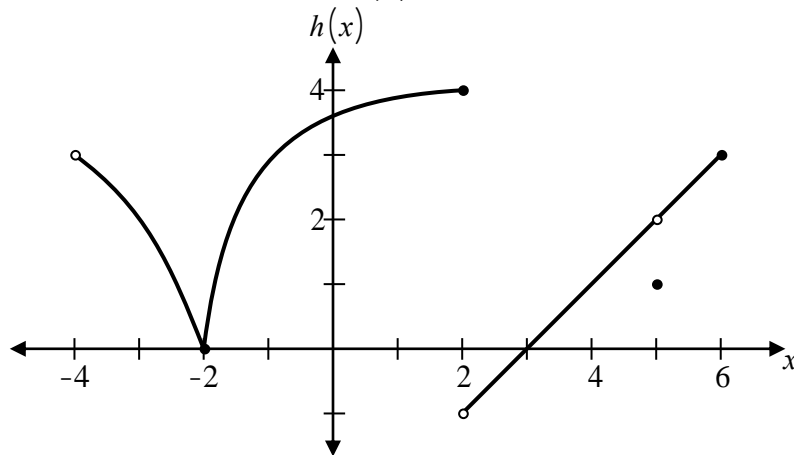


(1) Given the graph of $h(x)$ shown below, evaluate each of the following limits.



$$\lim_{x \rightarrow 2^+} h(x)$$

$$\lim_{x \rightarrow 2} h(x)$$

$$\lim_{x \rightarrow 5} h(x)$$

$$\lim_{x \rightarrow -4^+} h(x)$$

$$\lim_{x \rightarrow -2} h(x)$$

$$\lim_{x \rightarrow 2^-} h(x)$$

(2) Evaluate each limit. No work required.

$$\lim_{x \rightarrow \infty} \frac{x^3 - 5x}{3x^3 + 1}$$

$$\lim_{x \rightarrow 2^-} \frac{x + 2}{x - 2}$$

$$\lim_{x \rightarrow 2^+} [3x + 1]$$

$$\lim_{x \rightarrow -2^+} [x - 3]$$

$$\lim_{w \rightarrow 4^-} \frac{4 - w}{|w - 4|}$$

$$\lim_{x \rightarrow \infty} \frac{5x^4 - 2}{2x^3 + x}$$

$$\lim_{x \rightarrow 3} \frac{x^2 - 3x}{2x - 6}$$

$$\lim_{z \rightarrow -\infty} \frac{4z^4 - 3z}{2z^3 + 1}$$

$$\lim_{x \rightarrow -3^-} \frac{x + 2}{x^2 + 3x}$$

(3) Find each limit. Justify your answers by doing/showing analytic work.

$$\lim_{x \rightarrow \infty} \frac{3x^3 - 6x + 2}{2 - 6x^3}$$

$$\lim_{x \rightarrow 2} \frac{x^2 + x - 6}{x^2 - x - 2}$$

$$\lim_{z \rightarrow \infty} \frac{4z^5 - 2z + 3}{8z^3 - 4z + 2}$$

$$\lim_{x \rightarrow 3} \frac{\sqrt{x+1} - 2}{x - 3}$$

(4) Let $k(x) = \begin{cases} x, & x \text{ is an integer} \\ 0, & x \text{ is not an integer} \end{cases}$.

Find each of the following:

$$k(2) =$$

$$\lim_{x \rightarrow 2^-} k(x) =$$

$$\lim_{x \rightarrow 2^+} k(x)$$

$$\lim_{x \rightarrow 2} k(x)$$

Is k continuous at $x = 2$. (Answer only.)

Is k continuous at $x = 0$? (Answer and explain.)

For what values of x is k discontinuous?

(5) Let $f(x) = \begin{cases} x^2 + 1, & x \leq 1 \\ 4 - x, & x > 1 \end{cases}$. Is f continuous at $x = 1$? Justify your answer using the definition of continuity.