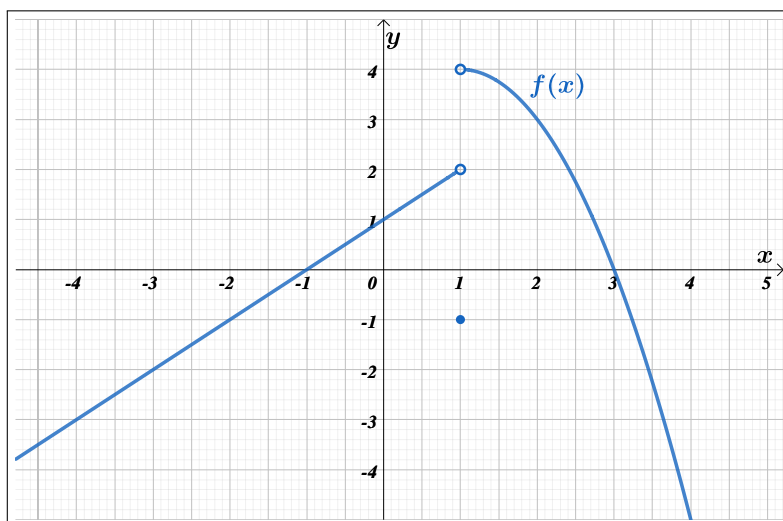




SECTIONS 1.1 AND 1.2

Problem 1. Find the following limits, if they exist. If the limit does not exist, use limit notation to describe any infinite behavior.



a. $\lim_{x \rightarrow 1^+} f(x)$

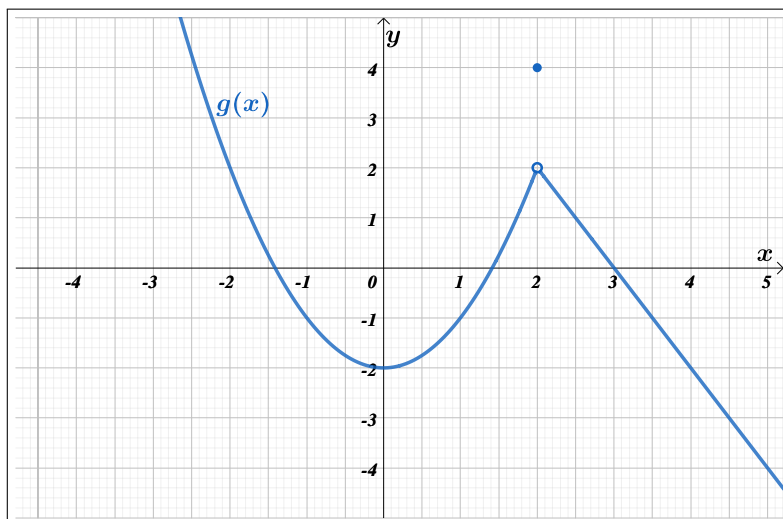
b. $\lim_{x \rightarrow 1^-} f(x)$

c. $\lim_{x \rightarrow 1} f(x)$

d. $\lim_{x \rightarrow -3} f(x)$



Problem 2. Find the following limits, if they exist. If the limit does not exist, use limit notation to describe any infinite behavior.



a. $\lim_{x \rightarrow 2^+} g(x)$

b. $\lim_{x \rightarrow 2^-} g(x)$

c. $\lim_{x \rightarrow 2} g(x)$



Problem 3. Complete the table below to numerically estimate $\lim_{x \rightarrow 4} \frac{x-4}{\sqrt{x}-2}$, if it exists. If the limit does not exist, use limit notation to describe any infinite behavior. Round answers to 4 decimal places.

x	3.9	3.99	3.999	4	4.001	4.01	4.1
$f(x)$							

Problem 4. Complete the table below to numerically estimate $\lim_{x \rightarrow 3} \frac{x^2-16}{x-3}$, if it exists. If the limit does not exist, use limit notation to describe any infinite behavior. Round answers to 4 decimal places.

x	2.9	2.99	2.999	3	3.001	3.01	3.1
$f(x)$							

Problem 5. Given that $\lim_{x \rightarrow -1} f(x) = 7$, $\lim_{x \rightarrow -1} g(x) = -2$, and $\lim_{x \rightarrow -1} h(x) = 0$, find the following limits, if they exist.

a. $\lim_{x \rightarrow -1} (f(x) + g(x))$

b. $\lim_{x \rightarrow -1} (g(x) - h(x))$

c. $\lim_{x \rightarrow -1} \frac{h(x)}{g(x) - f(x)}$

d. $\lim_{x \rightarrow -1} \frac{g(x) - f(x)}{h(x)}$

Problem 6. Find the following limits algebraically, if they exist. If the limit does not exist, use limit notation to describe any infinite behavior.

a. $\lim_{x \rightarrow 1} (3x^3 + 4x^2 + 5x + 6)$

b. $\lim_{x \rightarrow 1} \frac{x^2 + x - 12}{x - 3}$

c. $\lim_{x \rightarrow 3} \frac{x^2 + x - 12}{x - 3}$

d. $\lim_{x \rightarrow -4} \frac{x^2 + x - 12}{x - 3}$

e. $\lim_{h \rightarrow 0} \frac{(1 + h)^2 - 1}{h}$



Problem 7. If $f(x) = \begin{cases} -9 + 6x & \text{if } x \leq -2 \\ x^2 - 4 & \text{if } x > -2 \end{cases}$, find the following limits algebraically, if they exist. If the limit does not exist, use limit notation to describe any infinite behavior.

a. $\lim_{x \rightarrow -2^+} f(x)$

b. $\lim_{x \rightarrow -2^-} f(x)$

c. $\lim_{x \rightarrow -2} f(x)$



Problem 8. Find $\lim_{x \rightarrow 4} \frac{x - 4}{\sqrt{x} - 2}$, if it exists. If the limit does not exist, use limit notation to describe any infinite behavior.