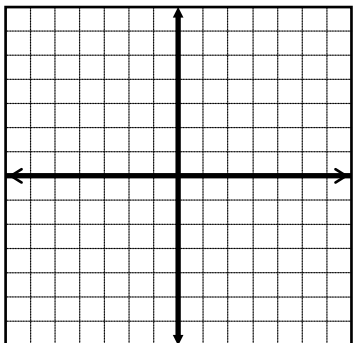


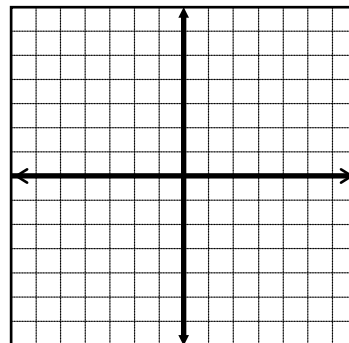
Finding Limits Using Properties of Limits (11.2)

Graphing a Function to Find the Limit: Graph the function. Then use your graph to find the limit.

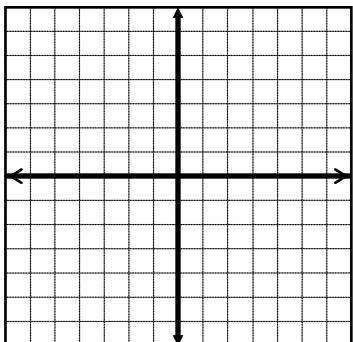
1) $f(x) = \frac{x^2 - 4}{x - 2}, \quad \lim_{x \rightarrow 2} f(x)$



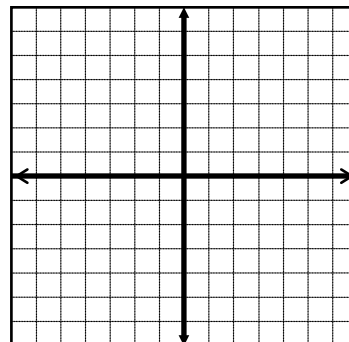
2) $f(x) = \begin{cases} 3x & \text{if } x < 1 \\ x + 2 & \text{if } x \geq 1 \end{cases}, \quad \lim_{x \rightarrow 1} f(x)$



3) $f(x) = \frac{x^2 - 9}{x + 3}, \quad \lim_{x \rightarrow -3} f(x)$



4) $f(x) = \begin{cases} -x & \text{if } x < 0 \\ \sin x & \text{if } x \geq 0 \end{cases}, \quad \lim_{x \rightarrow 0} f(x)$



Using Limit Properties to Find the Limit: Use properties of limits to find the indicated limit. It may be necessary to rewrite an expression before limit properties can be applied.

5) $\lim_{x \rightarrow -2} 5x^2$

6) $\lim_{x \rightarrow 2} \frac{3x}{x - 4}$

7) $\lim_{x \rightarrow -1} \sqrt{5x^2 + 4}$

8) $\lim_{x \rightarrow \frac{\pi}{6}} \frac{\cos x}{1 + \sin x}$

Strategies for Finding Limits When the Limit of the Denominator is Zero: Use properties of limits to find the indicated limit. It may be necessary to rewrite an expression before limit properties can be applied.

9) $\lim_{x \rightarrow 3} \frac{x^2 - x - 6}{x^2 - 9}$

10) $\lim_{x \rightarrow 1} \frac{x^2 - 1}{x^3 - 1}$

11) $\lim_{x \rightarrow 2} \frac{\frac{1}{x+4} - \frac{1}{4}}{x}$

12) $\lim_{x \rightarrow 9} \frac{\sqrt{x} - 3}{x - 9}$

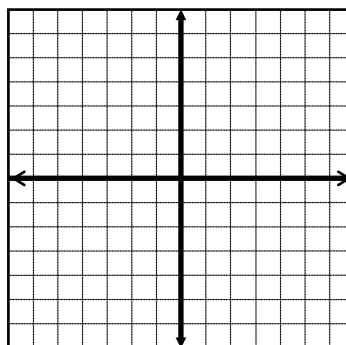
Using Limit Properties to Find One-Sided Limits: A piecewise function is given. Use properties of limits to find the indicated limit, or state that the limit does not exist.

13) $f(x) = \begin{cases} x^2 + 6 & \text{if } x < 2 \\ x^3 + 2 & \text{if } x \geq 2 \end{cases}$

a) $\lim_{x \rightarrow 2^-}$

b) $\lim_{x \rightarrow 2^+}$

c) $\lim_{x \rightarrow 2}$



14) $f(x) = \begin{cases} \frac{x^2 - 16}{x - 4} & \text{if } x \neq 4 \\ 7 & \text{if } x = 4 \end{cases}$

a) $\lim_{x \rightarrow 4^-}$

b) $\lim_{x \rightarrow 4^+}$

c) $\lim_{x \rightarrow 4}$

