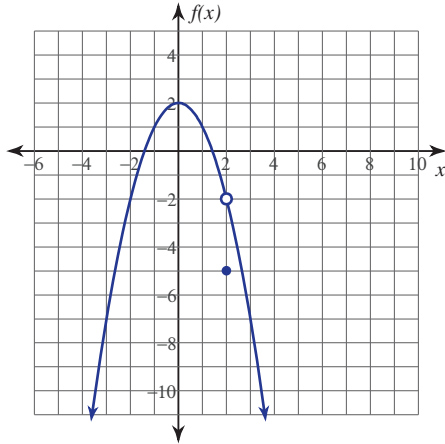


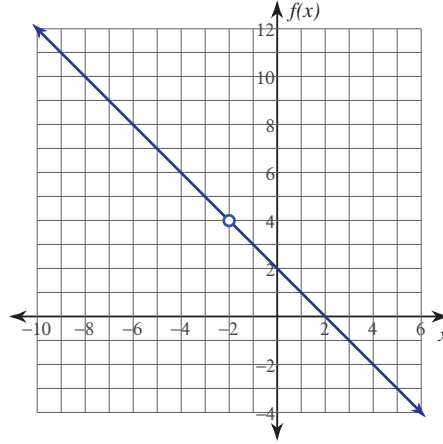
Evaluating Limits

Evaluate each limit.

1) $\lim_{x \rightarrow 2} f(x), f(x) = \begin{cases} -x^2 + 2, & x \neq 2 \\ -5, & x = 2 \end{cases}$

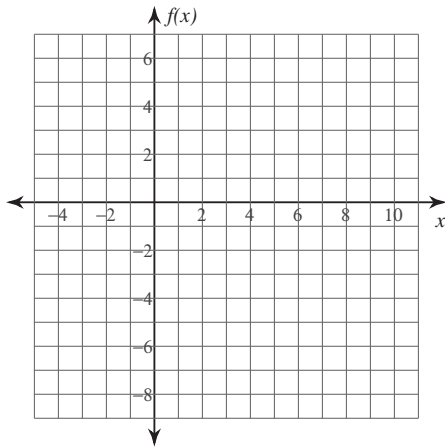


2) $\lim_{x \rightarrow -2} -\frac{x^2 - 4}{x + 2}$

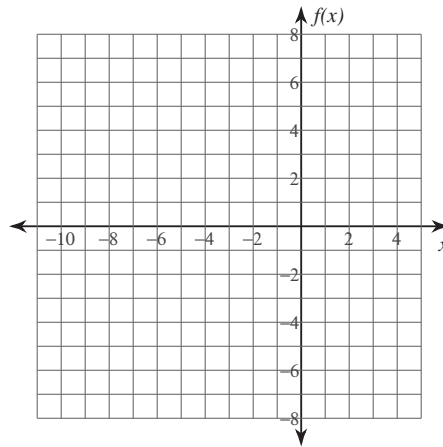


Evaluate each limit. You may use the provided graph to sketch the function.

3) $\lim_{x \rightarrow 3} \frac{x^2 - 7x + 12}{x - 3}$



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



Evaluate each limit.

5) $\lim_{x \rightarrow 0} f(x), f(x) = \begin{cases} x + 1, & x \neq 0 \\ 2, & x = 0 \end{cases}$

6) $\lim_{x \rightarrow 3} f(x), f(x) = \begin{cases} 2 + \frac{x}{2}, & x \neq 3 \\ 2, & x = 3 \end{cases}$

7)
$$\lim_{x \rightarrow 1} \frac{x^2 - 1}{x - 1}$$

8)
$$\lim_{x \rightarrow 5} \frac{x^2 - 5x}{x - 5}$$

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

10)
$$\lim_{x \rightarrow -5} \frac{x^2 + 3x - 10}{x + 5}$$

11)
$$\lim_{x \rightarrow 0} \frac{\frac{1}{-4 + x} + \frac{1}{4}}{x}$$

12)
$$\lim_{x \rightarrow -3} \frac{x}{\frac{1}{3 + x} - \frac{1}{3}}$$

13)
$$\lim_{x \rightarrow 5} \frac{x - 5}{\sqrt{x + 4} - 3}$$

14)
$$\lim_{x \rightarrow 3} \frac{\sqrt{x + 6} - 3}{x - 3}$$

Critical thinking questions:

15) Give an example of a limit of a rational function where the limit at -1 exists, but the rational function is undefined at -1.

16) Give two values of a where the limit cannot be solved using direct evaluation. Give one value of a where the limit can be solved using direct evaluation.

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