

1. Using the computations you have done in the pre-class activity as well as the Limit Laws (Theorem 1, p. 66), compute the following limits. For and justify each step of your computations.

(a) $\lim_{x \rightarrow 1} \frac{x^2 + x - 2}{x - 2},$

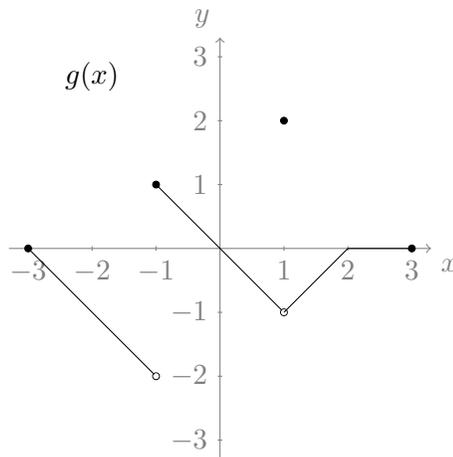
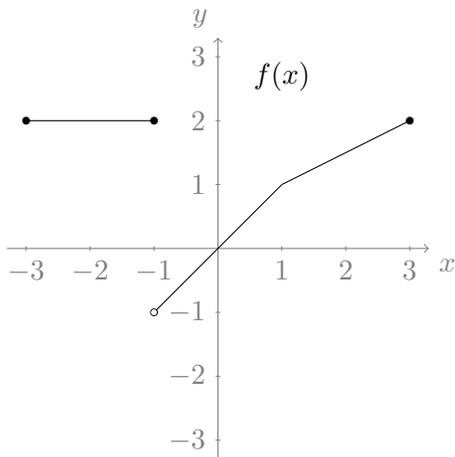
(b) $\lim_{x \rightarrow 1} \frac{x^2 + x - 2}{x - 1},$

(c) $\lim_{h \rightarrow 0} \frac{\sqrt{7h + 9} - 3}{h},$

(d) $\lim_{t \rightarrow -1} \frac{t^2 + 3t + 2}{t^2 - 1},$

(e) $\lim_{x \rightarrow -2} \frac{x + 2}{\sqrt{x^2 + 5} - 3},$

2. Here are the graphs of the functions f and g . Compute the limits indicated below.



(a) $\lim_{x \rightarrow 1} g(x)$

(b) $g(1)$

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

(d) $\lim_{x \rightarrow -2} \frac{f(x)}{g(x)}$

(e) $\lim_{x \rightarrow 1} \frac{f(x)}{g(x)}$

(f) $\lim_{x \rightarrow 0} \frac{f(x)}{g(x)}$

(g) $\lim_{x \rightarrow 2} \frac{f(x)}{g(x)}$

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

3. Compute the following limits. If a limit does not exist because the right-hand and left-hand limits differ, evaluate them separately.

a) $\lim_{x \rightarrow 1} \frac{x^2 + 3x + 2}{(x - 1)^2}$

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

4. Compute the following limits using the definition and/or the limit laws. Drawing the graphs of the functions may be helpful here.

(a) $\lim_{x \rightarrow 0} \sin(1/x),$

(b) $\lim_{x \rightarrow 0} x \sin(1/x).$