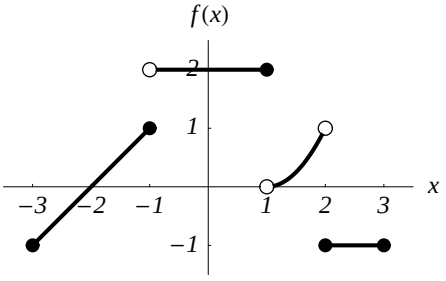
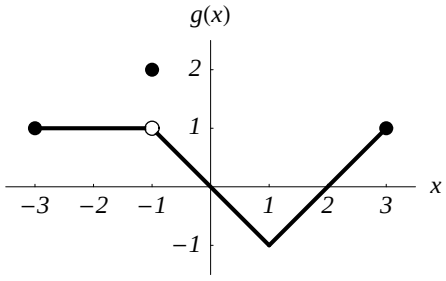
Math 1a. §2.3. Calculating Limits Using the Limit Laws.
Worksheet

Fall 2005

1. Is it possible for $\lim_{x\to a}[f(x)\cdot g(x)]$ even if $\lim\limits_{x\to a} f(x)$ and $\lim_{x\to a} g(x)$ do not exist?

2. The graphs of f and g are given below.





In each case, evaluate the expression. If the limit does not exist, say why.

(a) $\lim\limits_{x\to 0}[f(x)+g(x)]$

(b) $\lim\limits_{x\to 2}[f(x)+g(x)]$

(c) $\lim\limits_{x\to 1}[f(x)\cdot g(x)]$

(d) $\lim\limits_{x\to 2^-}[f(x)\cdot g(x)]$

(e) $\lim\limits_{x\to 2^+}[f(x)\cdot g(x)]$

(f) $\lim\limits_{x\to 2}[f(x)\cdot g(x)]$

(g) $\lim\limits_{x\to 0}\dfrac{f(x)}{g(x)}$

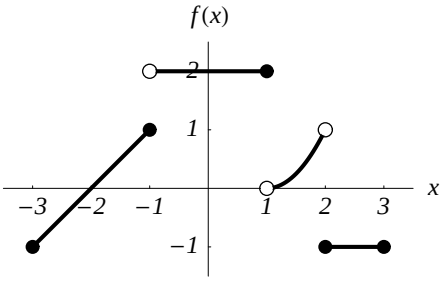
(h) $\lim\limits_{x\to 0}[f(x)\cdot \cos x]$

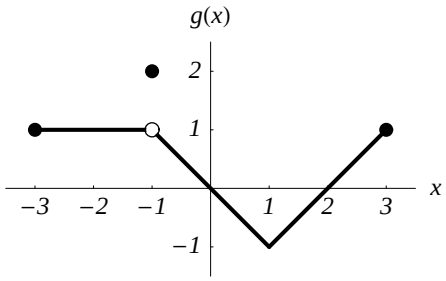
(i) $\lim\limits_{x\to 0} x^2 g(x)$

3. Use the Squeeze Theorem to show that

$$\lim_{x \to 0} x^2 \cos 20\pi x = 0.$$

4. Use the graphs below to evaluate each of the following limits. If the limit does not exist, explain why.





(a) $\lim_{x \to 0} \dfrac{f(x) - 2}{x}$

(b) $\lim_{x \to 3} \dfrac{f(x)}{x - 3}$

(c) $\lim_{h \to 0} \dfrac{g(-2 + h) - 3/2}{h}$

(d) $\lim_{h \to 0} \dfrac{g(2 + h)}{h}$