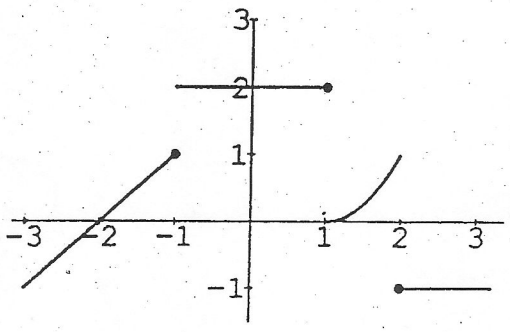
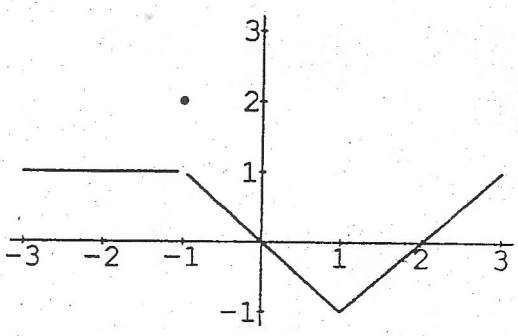
Section 4: Limits

1. The graphs of the functions f and g are given below.



graph of f



graph of g

Determine whether the following limits exist. If they do, then find the limit.

a. $\lim_{x\to -1} f(x)$

b. $\lim_{x\to 1} f(x)$

c. $\lim_{x\to -1} g(x)$

d. $\lim_{x\to 1} g(x)$

e. $\lim_{x\to -1} f(x)+g(x)$

f. $\lim_{x\to 0} 2f(x)+3g(x)$

g. $\lim_{x\to -1} f(x)g(x)$

h. $\lim_{x\to 2} f(x)g(x)$

i. $\lim_{x\to 0} \dfrac{f(x)}{g(x)}$

j. $\lim_{x\to 0} \dfrac{g(x)}{f(x)}$

k. $\lim_{x\to -2} g(f(x))$

l. $\lim_{x\to -1} f(g(x))$

2. The graphs of functions f and g are those given in Problem 1 above. Determine whether the following limits exist and find the limit when it exists.

a. $\lim_{x\to -1^-} f(x)$

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

c. $\lim_{x\to -1^-} g(x)$

d. $\lim_{x\to -1^+} g(x)$

e. $\lim_{x\to 0^-} f(x+2)$

f. $\lim_{x\to -1^-} f(x^2)$

tricky

tricky

3. a) For what values of x is the following equation true?

$$\frac{x^2-1}{x-1} = x+1$$

b) True or False $\lim_{x\to 1} \dfrac{x^2-1}{x-1} = \lim_{x\to 1} x+1$?