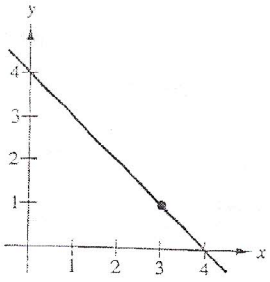
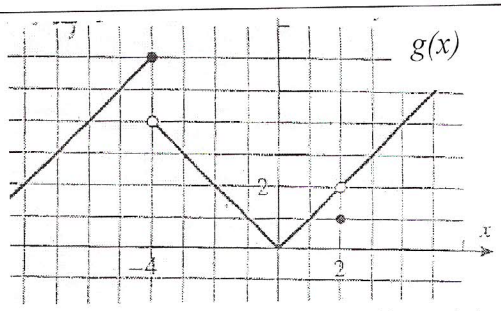
Name Key

Calculus Assignment #1
Limits

1. $\lim_{x\to 3}(4 - x) = 1$



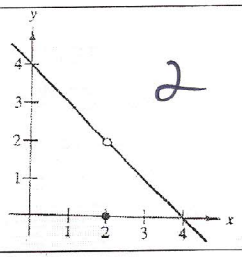
2.



a. $\lim_{x\to 2} g(x)$ 2 b. $\lim_{x\to -2} g(x)$ 2 c. $\lim_{x\to -4} g(x)$ DNE

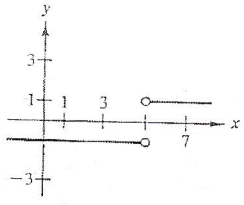
3. $\lim_{x\to 2} f(x)$

$$f(x) = \begin{cases} 4 - x, & x \neq 2 \\ 0, & x = 2 \end{cases}$$



2

4. $\lim_{x\to 5} \dfrac{|x - 5|}{x - 5}$ DNE

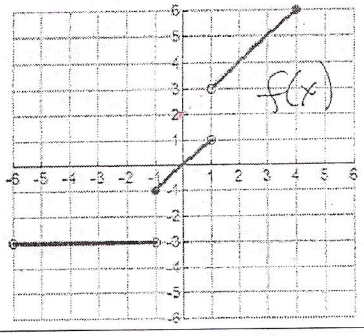


5. Fill in the table, then find the limit.

$\lim_{x\to 0} \dfrac{\cos x - 1}{x}$ = 0

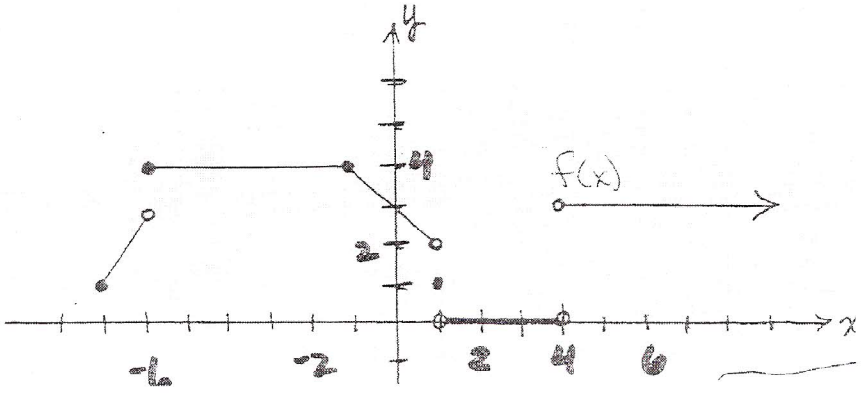
x	−0.1	−0.01	−0.001	0.001	0.01	0.1
$f(x)$	.04996	.005	.0005	.0005	.005	.05

6. Determine the function and domain for each piece, then write the piecewise function.



$$f(x) = \begin{cases} -3, & -6 < x < -1 \\ x, & -1 \leq x < 1 \\ x+2, & 1 \leq x \leq 4 \end{cases}$$

Use the picture below to answer questions 7-10.



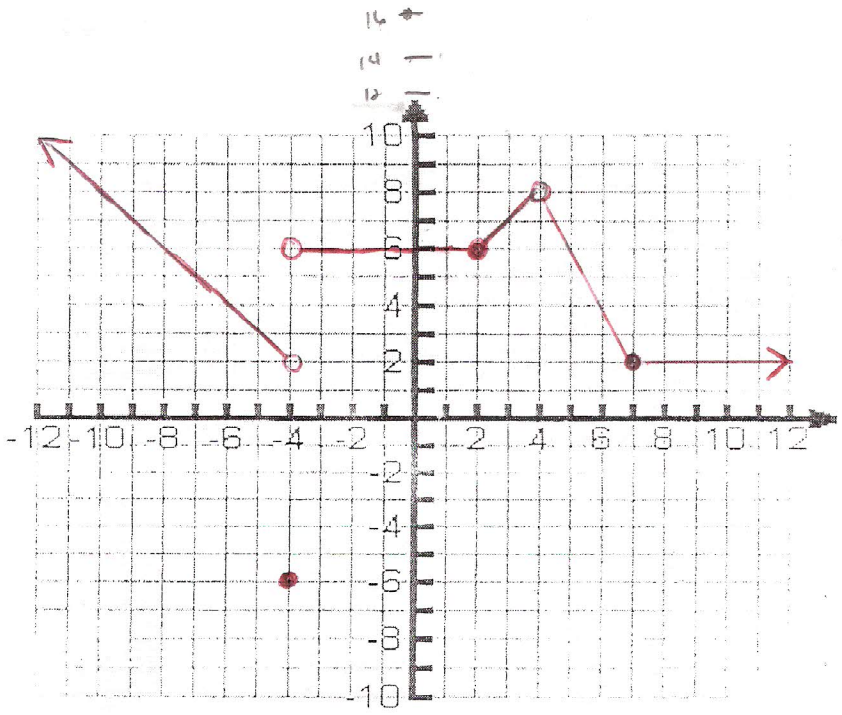
7a. $f(-6)$ 4 b. $\lim_{x\to -6} f(x)$ DNE

8a. $f(-1)$ 4 b. $\lim_{x\to -1} f(x)$ 4

9. $\lim_{x\to -3} f(x)$ 4

10. $\lim_{x\to -7} f(x)$ DNE

11.



Given the following piecewise function:

$$h(x) = \begin{cases} -x-2, & -\infty < x < -4 \\ -6, & x = -4 \\ 6, & -4 < x < 2 \\ x+4, & 2 \le x < 4 \\ -2x+16, & 4 < x \le 7 \\ 2, & 7 < x < \infty \end{cases}$$

a) $\lim_{x \to -4} h(x) =$ DNE

b) $h(-4) =$ -6

c) $\lim_{x \to 0} h(x) =$ 6

d) $h(0) =$ 6

e) $\lim_{x \to 2} h(x) =$ 6

f) $h(2) =$ 6

g) $\lim_{x \to 4} h(x) =$ 8

h) $h(4) =$ DNE

i) $\lim_{x \to 7} h(x) =$ 2

j) $h(7) =$ 2

k) Sketch the graph of $h(x)$