Limit Worksheet

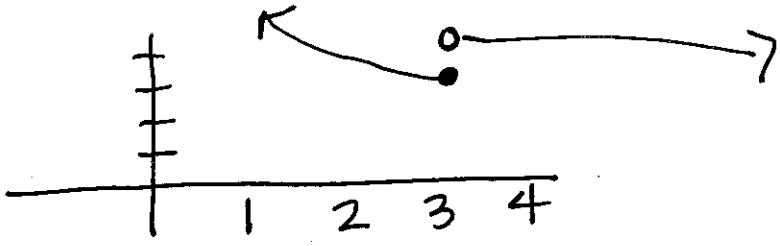
Consider the chart below.

x	1.9	1.99	1.999	2	2.001	2.01	2.1
$f(x)$	3.1	3.01	3.001	3	4.001	4.01	4.1

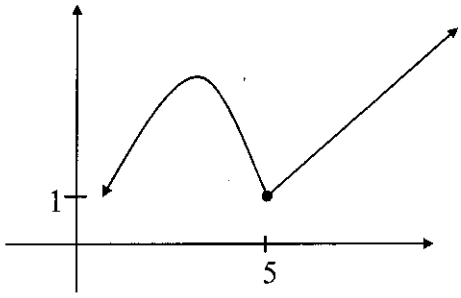
1. Find $f(2)$. $= 3$

2. Find $\lim_{x\to 2} f(x)$. Explain your answer. dne
not going to same 'y' value from both sides

3. Sketch a graph of the function around the value $x = 2$.



Consider the graph below.



1. Approximate the values for the chart below.

x	4.9	4.99	4.999	5	5.001	5.01	5.1
$f(x)$	1.6	1.4	1.2	1	1.001	1.01	1.1

2. Find $\lim_{x\to 5} f(x)$. Explain your answer. $= 1$ limit is same from both sides

3. Find $f(5)$. $= 1$

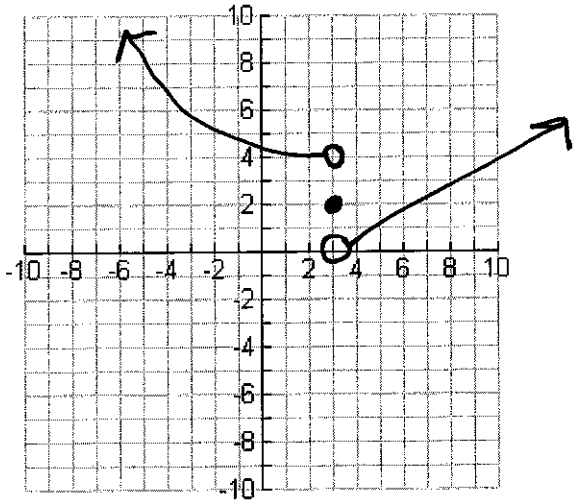
1. Sketch a graph that has the following properties.

$f(3) = 2$

$\lim_{x \to 3^-} f(x) = 4$

$\lim_{x \to 3^+} f(x) = 0$

$f(x) > 0$ for all values of x



2. Refer to the graph of $g(x)$ shown below in order to answer the following questions. If a limit does not exist explain why.

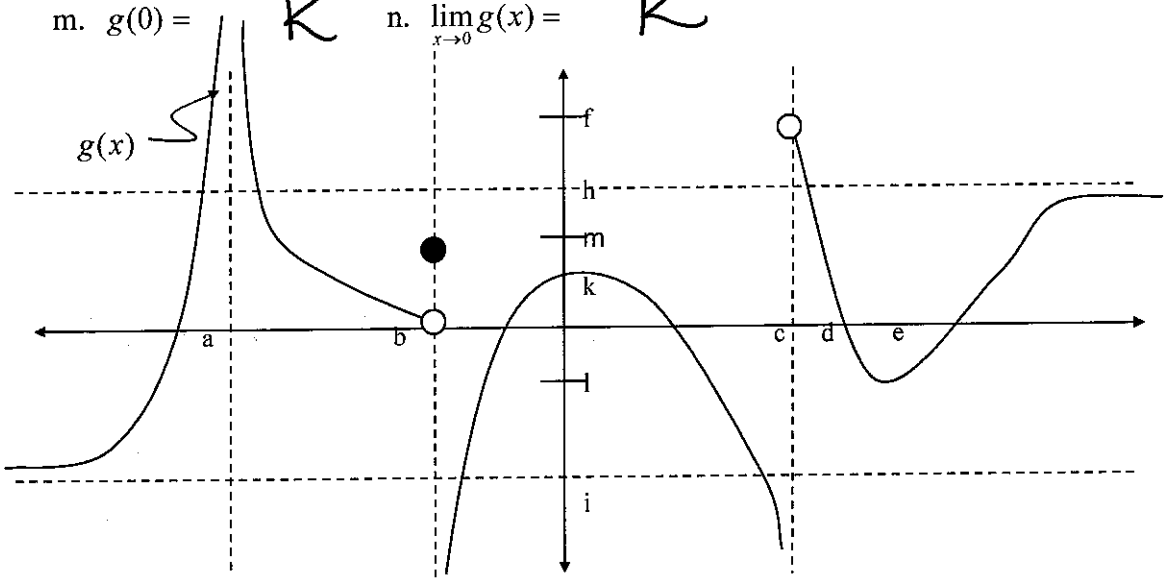
a. $\lim_{x \to \infty} g(x) =$ h b. $\lim_{x \to -\infty} g(x) =$ i c. $\lim_{x \to a^+} g(x) =$ $+\infty$

d. $\lim_{x \to a^-} g(x) =$ $+\infty$ e. $\lim_{x \to a} g(x) =$ $+\infty$ f. $\lim_{x \to b^+} g(x) =$ $-\infty$

g. $\lim_{x \to b^-} g(x) =$ 0 h. $\lim_{x \to b} g(x) =$ dne i. $\lim_{x \to c} g(x) =$ dne

j. $\lim_{x \to d} g(X) =$ m k. $g(a) =$ und l. $g(b) =$ m

m. $g(0) =$ k n. $\lim_{x \to 0} g(x) =$ k



Evaluate the following limits.

1. $\lim_{x\to 2}\frac{3x+4}{x+1} = \frac{10}{3}$ D.S.

2. $\lim_{x\to 0^+}\sqrt{x} = 0$ D.S. look @ table

3. $\lim_{x\to 0^-}\sqrt{x}$ = dne look @ table

4. $\lim_{x\to 0}\sqrt{x}$ = dne

5. $\lim_{x\to 0}\frac{\sin x}{x} = 1$ memorize

6. $\lim_{x\to \pi}\frac{\sin(x-\pi)}{x-\pi} = 1$

7. $\lim_{h\to 0}\frac{2(3+h)-2(3)}{h} = \boxed{2}$

$\frac{6+2h-6}{h} = \frac{2h}{h} = 2$

8. $\lim_{h\to 0}\frac{(x+h)^2-x^2}{h} = \boxed{2x}$

$\frac{x^2+2xh+h^2-x^2}{h} = \frac{2xh+h^2}{h} = \frac{h(2x+h)}{h} = 2(x)+0$

1. Sketch a graph of a function with the following properties:

- $\lim_{x\to 0^+} f(x) = 2$
- $\lim_{x\to 3} f(x) = 0$
- $f(0) = 0$
- $\lim_{x\to 0^-} f(x) = -1$
- $\lim_{x\to -1} f(x) = 4$
- $f(3) = 1$