

Homework 14.1: Finding Limits Numerically and Graphically
Place answers on this paper.

#1-3 Complete the table of values (to five decimal places) and use the table to estimate the value of the limit.

1. $\lim_{x \rightarrow 2} \frac{x-2}{x^2+x-6} = \underline{\hspace{2cm}}$

x	1.9	1.99	1.999	2.001	2.01	2.1
$f(x)$						

2. $\lim_{x \rightarrow 0} \frac{e^x - 1}{x} = \underline{\hspace{2cm}}$

x	-0.1	-0.01	-0.001	0.001	0.01	0.1
$f(x)$						

3. $\lim_{x \rightarrow 0} \frac{\sin x}{x} = \underline{\hspace{2cm}}$

x	± 1	± 0.5	± 0.1	± 0.05	± 0.01
$f(x)$					

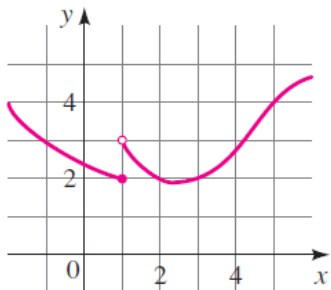
#4-5 Use a table of values to estimate the value of the limit.

4. $\lim_{x \rightarrow -4} \frac{x+4}{x^2+7x+12}$

5. $\lim_{x \rightarrow 0} \frac{\sqrt{x+9}-3}{x}$

6. For the function f whose graph is given, state the value of the given quantity, if it exists.

- a) $\lim_{x \rightarrow 1^-} f(x)$ b) $\lim_{x \rightarrow 1^+} f(x)$ c) $\lim_{x \rightarrow 1} f(x)$ d) $\lim_{x \rightarrow 5} f(x)$ e) $f(5)$



7. For the function g whose graph is given, state the value of the given quantity, if it exists.

a) $\lim_{x \rightarrow 0^-} g(t)$

b) $\lim_{x \rightarrow 0^+} g(t)$

c) $\lim_{x \rightarrow 0} g(t)$

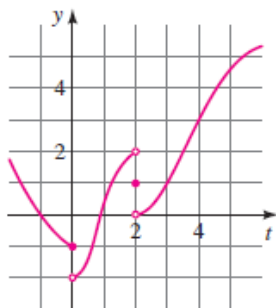
d) $\lim_{x \rightarrow 2^-} g(t)$

e) $\lim_{x \rightarrow 2^+} g(t)$

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

g) $g(2)$

h) $\lim_{x \rightarrow 4} g(t)$



8. State the value of the limit, if it exists, from the given graph of f .

a) $\lim_{x \rightarrow 3} f(x)$

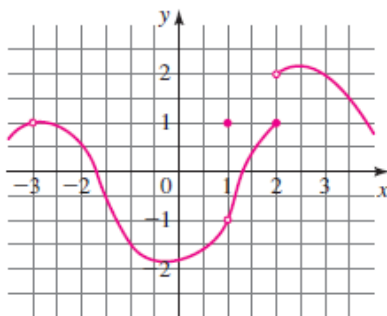
b) $\lim_{x \rightarrow 1} f(x)$

c) $\lim_{x \rightarrow -3} f(x)$

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

e) $\lim_{x \rightarrow 2^+} f(x)$

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



#9-10 Graph the piecewise-defined function and use your graph to find the values of the limits, if they exist.

9.

$$f(x) = \begin{cases} 2 & \text{if } x < 0 \\ x+1 & \text{if } x \geq 0 \end{cases}$$

a) $\lim_{x \rightarrow 0^-} f(x)$

b) $\lim_{x \rightarrow 0^+} f(x)$

c) $\lim_{x \rightarrow 0} f(x)$

10.

$$f(x) = \begin{cases} 2x + 10 & \text{if } x \leq -2 \\ -x + 4 & \text{if } x > -2 \end{cases}$$

(a) $\lim_{x \rightarrow -2^-} f(x)$

(b) $\lim_{x \rightarrow -2^+} f(x)$

(c) $\lim_{x \rightarrow -2} f(x)$