

1. For each of the following functions, first complete the table and then, based on the table, find the given limits. If a limit does not exist, write "DNE".

(a) $f(x) = \frac{x^2 - x - 6}{x - 3}$

x	2.9	2.99	2.999	2.9999	3.1	3.01	3.001	3.0001
$f(x)$								

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

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

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

(b) $f(x) = \frac{|x - 3|}{x - 3}$

x	2.9	2.99	2.999	2.9999	3.1	3.01	3.001	3.0001
$f(x)$								

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

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

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

(c) $f(x) = \frac{1}{x^2}$

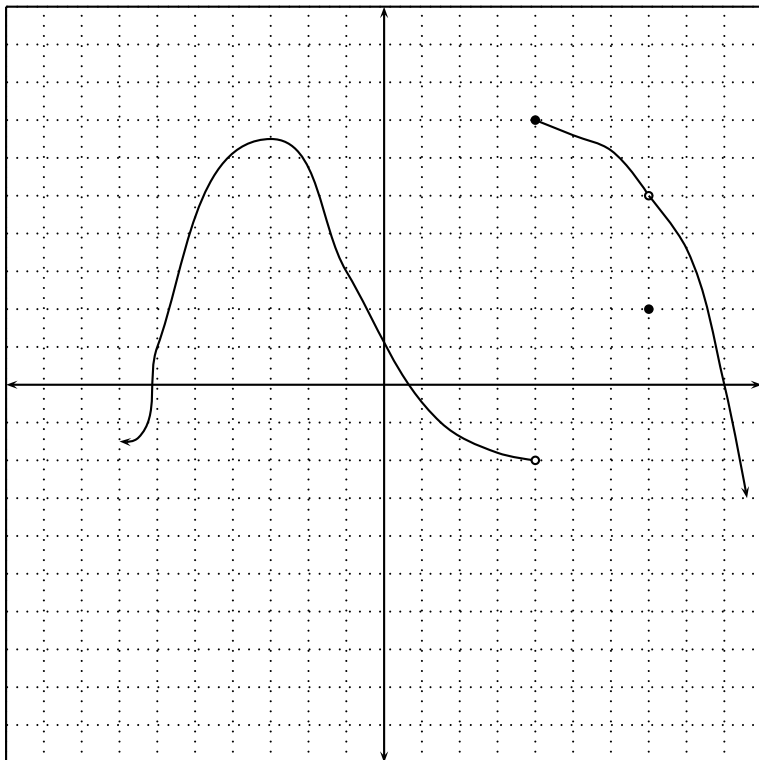
x	-0.1	-0.01	-0.001	-0.0001	0.1	0.01	0.001	0.0001
$f(x)$								

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

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

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

2. Use the following graph to find each of the following. If a limit does not exist, write "DNE".



(a) $f(-1)$

(c) $\lim_{x \rightarrow 4^+} f(x)$

(e) $f(7)$

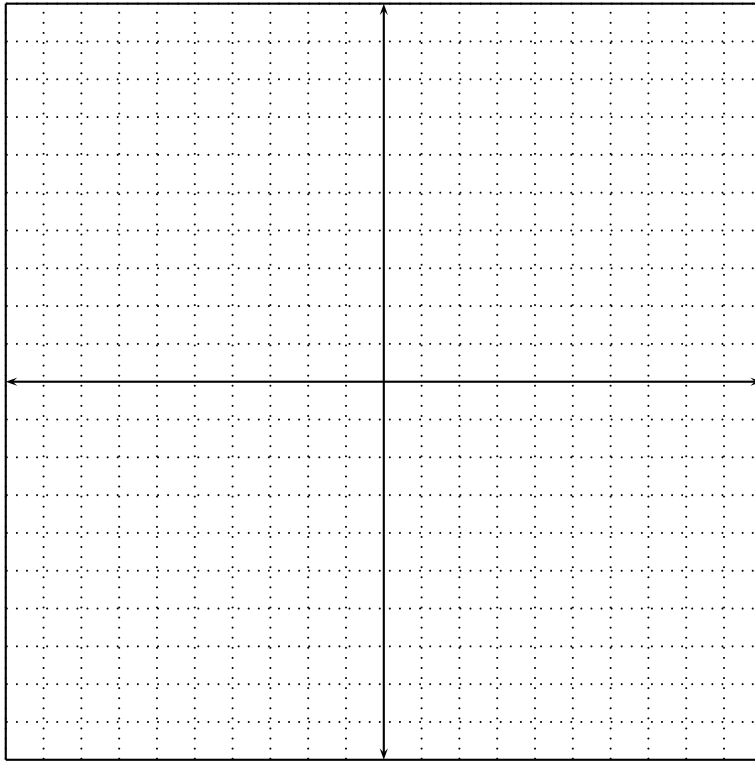
(b) $\lim_{x \rightarrow 4^-} f(x)$

(d) $\lim_{x \rightarrow 4} f(x)$

(f) $\lim_{x \rightarrow 7} f(x)$

3. Let f be the function defined by $f(x) = \begin{cases} -x + 3 & \text{if } x < 2 \\ 3 & \text{if } x = 2 \\ -x^2 + 6x - 3 & \text{if } x > 2 \end{cases}$

(a) Sketch the graph of f .



(b) For each of the following, find the limit if it exists. If the limit does not exist, write "DNE".

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

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

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

4. For each of the following, find the limit if it exists; if the limit does not exist, write "DNE".

(a) $\lim_{x \rightarrow 5} x$

(d) $\lim_{x \rightarrow 9} \frac{x - 9}{\sqrt{x} - 3}$

(g) $\lim_{x \rightarrow 5} \frac{\frac{1}{x} - \frac{1}{5}}{x - 5}$

(b) $\lim_{x \rightarrow 5} 7$

(e) $\lim_{x \rightarrow -7} \frac{\sqrt{x+7}}{x+4}$

(h) $\lim_{h \rightarrow 0} \frac{(x+h)^2 - x^2}{h}$

(c) $\lim_{x \rightarrow 4} \frac{x^2 - 6x + 5}{x^2 - 9}$

(f) $\lim_{x \rightarrow -3} \frac{x^4 - 16}{x - 4}$