

1. For the function g whose graph is below, state the value of each quantity. If it does not exist, briefly explain why. (5 pts.)

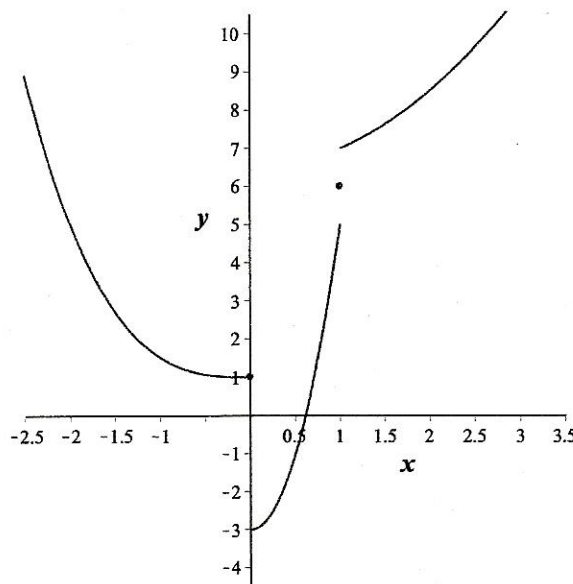
(a) $\lim_{x \rightarrow 0^+} g(x) = -3$

(b) $\lim_{x \rightarrow 1^-} g(x) = 5$

(c) $\lim_{x \rightarrow 1^+} g(x) = 7$

(d) $\lim_{x \rightarrow 1} g(x)$ does not exist (b/c $\lim_{x \rightarrow 1^-} g(x) \neq \lim_{x \rightarrow 1^+} g(x)$)

(e) $g(1) = 6$



2. Determine the limit of the following: $\lim_{x \rightarrow 5^+} \frac{x+1}{x-5}$. (2 pts.)

As $x \rightarrow 5^+$, $x+1 \rightarrow 6^+$. And $x-5 \rightarrow 0^+$. Therefore, $\lim_{x \rightarrow 5^+} \frac{x+1}{x-5} = \infty$

3. With your calculator, estimate the value of the following limit: $\lim_{x \rightarrow 0} \frac{e^{2x} - 1}{x}$. (3 pts.)

x	-0.1	0.1	-0.01	0.01	-0.001	0.001	0.0001
$\frac{e^{2x}-1}{x}$	1.813	2.214	1.980	2.020	1.998	2.002	2.0002

It appears $\lim_{x \rightarrow 0} \frac{e^{2x}-1}{x} = 2$.

Extra Credit

Determine the limit of the following if it exists: $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2}$. (2 pts.)

$\frac{x^2 - 4}{x - 2} = \frac{(x-2)(x+2)}{x-2} = x+2$ if $x \neq 2$. $\therefore \lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2} = \lim_{x \rightarrow 2} (x+2) = 4$