

Limits That Do NOT Exist

p. 98 - 105 (2.2)

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Some reasons why limits don't exist:

1. The function approaches a different number from the left side of c than from the right side.
2. The function increases/decreases without bound around c .
3. The function oscillates between 2 fixed values.

Find each limit below, if it exists. If it does not, tell why it is not a limit! Use a graphing calculator for #1 & #2.

1. $\lim_{x \rightarrow -2} \frac{x^2 + 2}{x + 2}$ DNE
(table) because inc/dec. without bound

2. $\lim_{x \rightarrow 0} \left(\tan\left(\frac{1}{x^2}\right) \right)$ DNE
oscillates

3. Find $\lim_{x \rightarrow 8} h(x)$ using the function $h(x)$ in the table below.

x	7.9	7.99	7.999	8	8.001	8.01	8.1
$h(x)$	8.21	19.47	26.7	ERROR	-26.7	-19.47	-8.21

DNE because inc/dec without bound

4. Use the graph to the right to find

$\lim_{x \rightarrow -3} F(x)$.

DNE
 because
 $\lim_{x \rightarrow -3^-} F(x) \neq \lim_{x \rightarrow -3^+} F(x)$

