

# Quiz 1

PrepaTec + CALCULUS I Quiz # 1B 78

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1. Estimate the given limit using a numerical approximation (15 pts)

$\lim_{x \rightarrow 2} \frac{x+1}{x-2}$

$x$	1.9	1.99	1.999	<del>2</del>	2.001	2.01	2.1
$f(x)$	-2.9	-2.99	-2.999	<del>undefined</del>	3.001	3.01	3.1
	<u>2.9</u>	<u>2.99</u>	<u>2.999</u>		<u>3.001</u>	<u>3.01</u>	<u>3.1</u>
	-0.1	-0.01	-0.001		0.001	0.01	0.1

$\rightarrow$  not a match

2. Graph the following functions and find their limits.

$$f(x) = \begin{cases} x^2 - 1 & x > 0 \\ -x & x \leq 0 \end{cases} \quad (15 \text{ pts})$$

Find (20 pts)

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

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

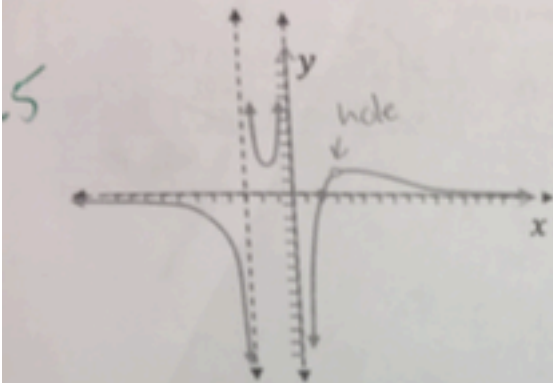
c)  $\lim_{x \rightarrow 0^-} f(x)$  1

d)  $f(0)$  0

$\leftarrow$  OK according to your graph

-10

3. Based on the graph find the limits (20 pts)



a)  $\lim_{x \rightarrow -1^-} f(x)$   $\emptyset$  ✓

b)  $\lim_{x \rightarrow -1^+} f(x)$   $\infty$  ✗

c)  $\lim_{x \rightarrow -1} f(x)$   $\emptyset$  ✓

d)  $f(3)$   $7$  ✓

4. Evaluate the following limits algebraically (30 pts)

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Notation of  $\lim_{x \rightarrow 3} \left( \frac{\sqrt{x+1}-2}{x-3} \right) = \frac{1}{4}$  ✓

5  $\frac{\sqrt{x+1}-2}{x-3} \cdot \frac{\sqrt{x+1}+2}{\sqrt{x+1}+2} = \frac{x+1-4}{x-3}$

$\frac{x-3}{x-3} \cdot \frac{1}{\sqrt{x+1}+2} = \frac{1}{4}$

b)  $\lim_{x \rightarrow 2} \left( \frac{x^2-2x}{x} \right) = -2$  ✓

$\frac{x(x-2)}{x} = x-2$

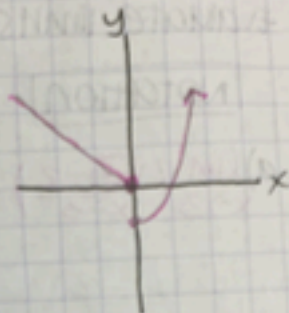
# Corrections Quiz 1

1)  $\lim_{x \rightarrow 2} \frac{x+1}{x-2} = \infty$

$x$	1.9	1.99	1.999	2	2.001	2.01	2.1
$f(x)$	-29	-299	-2999	?	3001	301	31

2) Graph & find limits

$$f(x) = \begin{cases} x^2 - 1 & x > 0 \\ -x & x \leq 0 \end{cases}$$



a)  $\lim_{x \rightarrow 0^+} f(x) = -1$

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

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

d)  $f(0) = \emptyset$

3) Based on graph (quiz) find limits

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

4) Evaluate limits algebraically

NOTATION

$$a) \lim_{x \rightarrow 3} \left( \frac{\sqrt{x+1}-2}{x-3} \right) = \frac{1}{4} //$$

$$b) \lim_{x \rightarrow 0} \left( \frac{x^2-2x}{x} \right) = -2$$

$$\lim_{x \rightarrow 3} \left( \frac{\sqrt{x+1}-2}{x-3} \right) \cdot \frac{\sqrt{x+1}+2}{\sqrt{x+1}+2}$$

$$\lim_{x \rightarrow 0} \frac{x(x-2)}{x} = x-2$$

$$\lim_{x \rightarrow 3} \left( \frac{x-3}{x-3} \cdot \frac{1}{\sqrt{x+1}+2} \right) = \frac{1}{4}$$