Limits Activity

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name of Group Members\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Given the flowing graph of the function *f* find the following
	1. $\lim\_{x\to -5^{-}}f\left(x\right)$
	2. $\lim\_{x\to -5+}f\left(x\right)$
	3. $\lim\_{x\to -5}f\left(x\right)$
	4. $\lim\_{x\to 1^{+}}f\left(x\right)$
	5. $\lim\_{x\to 1}f\left(x\right)$
	6. *f(1)*
	7. $\lim\_{x\to -8^{+}}f\left(x\right)$

 g

1. Find the following limits:
	1. $\lim\_{x\to -7}\frac{x-7}{x^{2}-9}$
	2. $\lim\_{x\to 2+}\frac{1}{x-2}$
	3. $\lim\_{x\to 2-}\frac{1}{x-2}$
	4. $\lim\_{x\to 7}\frac{x-7}{x^{2}-49}$
	5. $\lim\_{x\to -1}\frac{x^{2}-x-2}{x+1}$
2. Draw a graph of a function *f* in the axes below that satisfies the following criteria and then indicate at what points the graph is discontinuous:
* $f\left(-2\right)=2$ and$\lim\_{x\to -2}f\left(x\right)=1$
* $f\left(-1\right)=3$ and$\lim\_{x\to -1}f\left(x\right)=3$
* $f\left(0\right)=-1$,$ \lim\_{x\to 0+}f\left(x\right)=-2$ and$\lim\_{x\to 0-}f\left(x\right)=2$
* $f\left(1\right)=Undefined$ and $\lim\_{x\to 1}f\left(x\right)=0$
* $f\left(2\right)=1$ and$ \lim\_{x\to 2}f\left(x\right)=Undefined$



1. Given that $f\left(x\right)=\frac{(x+3)(x-1)}{(x-1)(x+1)}$
2. Find the following linits:
	* 1. $\lim\_{x\to 1^{+}}f\left(x\right)$
		2. $\lim\_{x\to 1^{-}}f\left(x\right)$
		3. $\lim\_{x\to -1^{+}}f\left(x\right)$
		4. $\lim\_{x\to -1^{-}}f\left(x\right)$
3. What are the *x* and *y* intercepts of *f?*
4. What is the long term behavior of *f* as $x\rightarrow \pm \infty $?
5. Draw a graph of the function *f* consistent with all the above.



1. For each of the following,
	* 1. Constuct a numberline with the signs of *f (+,-,0,undefined)*
		2. Find the *x* and *y* intercepts of *f*
		3. Find the limits from the left and the right for all values of *x* for which *f(x)* is undefined.
		4. Find the long term behavior of *f* as $x\rightarrow \pm \infty $
		5. Draw a graph of *f* that iss consistent with the above.
	1. $f\left(x\right)=\frac{\left(x-1\right)}{x^{2}+3x-4}$
	2. $f\left(x\right)=\frac{(x-1)}{x^{2}-3x-10}$
	3. $f\left(x\right)=\frac{1}{x^{2}-2x-8}$
	4. $f\left(x\right)=\frac{1}{x^{3}-4x^{2}+4x}$