Math101 Name:

Quiz#2 ID No:

Code 001 Serial No:

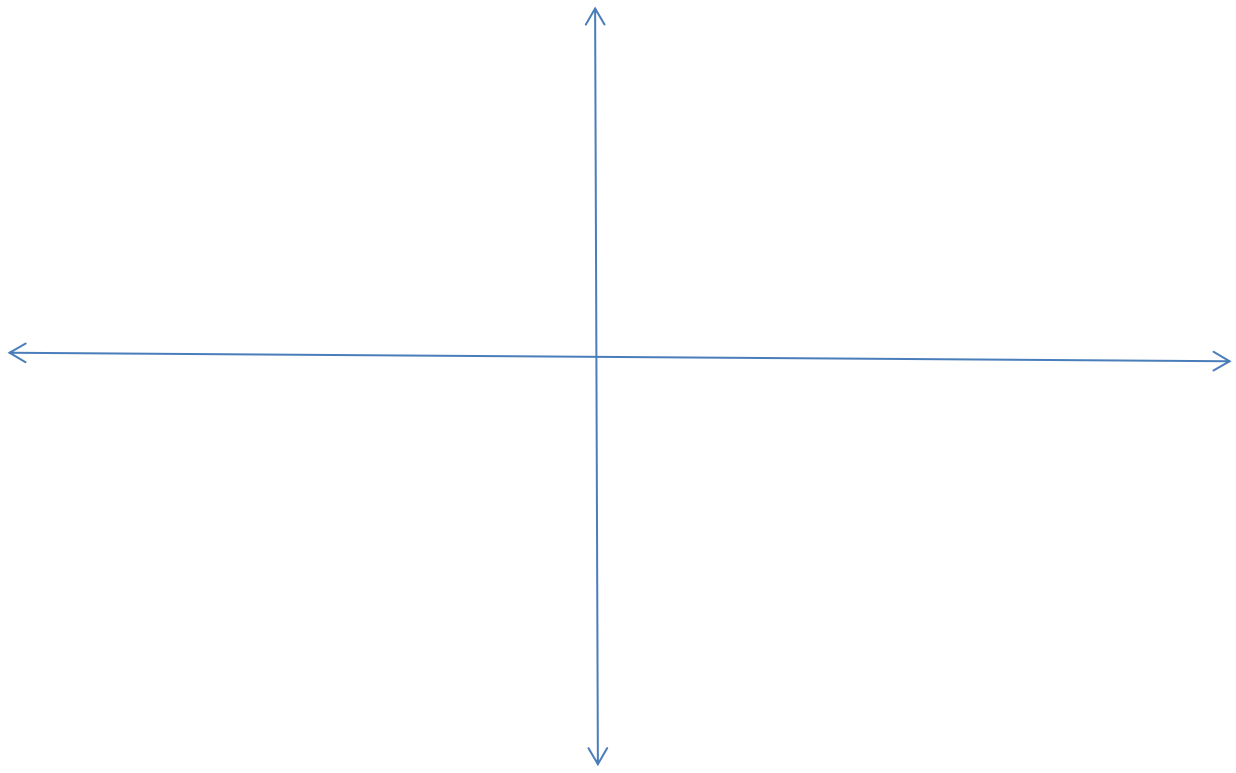
1- *Evaluate the limit if it exists*

$$\lim_{x\to 1}\left(\frac{x^2-|x-1|-1}{|x-1|}\right)$$

2- *Sketch the graph of a function f that satisfies all of the following conditions:*

$\lim_{x\to -6^-} f(x) = -\infty$; $\lim_{x\to -6^+} f(x) = \infty$; $\lim_{x\to -\infty} f(x) = -2$; $\lim_{x\to -2} f(x) = 1$;

$f(x)$ is undefined at -2; $\lim_{x\to 1^-} f(x) = -1$; $\lim_{x\to 1^+} f(x) = 2$; $f(1) = 4$



3- Let $f(x) = \begin{cases} \frac{6a}{x+1} & if\ x > 1 \\ 1 & if\ x = 1 \\ a^2 & if\ x < 1 \end{cases}$.

Find the value(s) of a so that $f(x)$ has a jump discontinuity.

4- *Use the Intermediate Value Theorem to show that the equation* $\cos x = \sqrt{x}$ *has at least one real root in the interval* $\left[0, \frac{\pi}{2}\right]$.